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Institute Looks Forward Hopefully

Members Assemble in Large Numbers—Judge Gary Opposed to Wage Reductions—Record of Iron and Steel Industry in Great War Reviewed

AT the twenty-fifth general meeting of the American Iron and Steel Institute, held in New York last Friday, there was an attendance of 1291 and although there was no attempt to conceal the fact that the iron and steel business at the present time is far from satisfactory, gloomy sentiment did not prevail and hope was frequently expressed that the bottom has been reached or that there will not be much more sagging of prices before the upturn comes, and that at a not far distant date there will be a fairly satisfactory volume of orders.

After Judge Gary had talked extemporaneously for more than an hour about his trip to South America, he paused and said, "Now I know I have talked a long time; do you really want me to go on and talk about business?" There were cries of "Go on" throughout the hall and he proceeded to discuss business and political conditions with much vigor. The applause with which the reference to President Coolidge was received was the most enthusiastic of the day.

Before proceeding to deliver his address, Judge Gary presented a resolution lately adopted by the board of directors of the Institute as follows:

> Resolved by the board of directors of the American Iron and Steel Institute, That to the extent the United States Government may need the assistance of the iron and steel industry in the maintenance of conditions adequate for the military defense of this country, we pledge the active efforts of the members of this board, and we express the belief that the entire iron and steel industry will approve the sentiment expressed and will cooperate in carrying it into practical effect.

The resolution was unanimously approved.

Mines of South America

Judge Gary told in detail of his extended trip to South America, describing briefly the cities and countries visited. Speaking of ore deposits of the Bethlehem Steel Corporation, Judge Gary said:

"We went past the big mine of the Bethlehem company, but did not stop, for lack of time. They have a great mine in Chile, not so very far from Valparaiso. They have a mountain of ore. Instead of mining from the top, they mine from the bottom. In order to get a short distance to the top, they go around and around the mountain, as you climb a mountain, and I think it takes about 26 miles to go a distance of two or three or four. They did not go there for convenience nor even for beauty, for landscape; they went there because they have iron ore that in iron content is about 70 per cent. Now, I am not going to brag too much about that, because I do not want to discredit the ore we have, but it is a good thing they have it, and there is a great abundance of it, not only on the Western coast but in other places."

Speaking of his visit to Brazil, Judge Gary referred briefly to visiting the manganese mine of the United States Steel Corporation. "Certainly," he said, "I could not speak of it at any length without bragging, which I detest, but it is worthwhile having. It is only 300 miles distant from Rio. There is plenty of manganese ore and we are very glad to own it, although we paid a very large price for it about three years ago." He gave an interesting description of the snake farm at São Paulo, where snakes are raised in large numbers in order to take from them the poison which is used as an antidote for snake bites. With great earnestness Judge Gary said, "Just one thought about those snakes. I could wish, I do wish, that the poison could be extracted from American politics." This sally was enthusiastically greeted.

Conditions at Washington

"To say that business is entirely satisfactory would be offending my sense of truth and propriety," said Judge Gary. "To say that we are not producing as much as we would like or more than three-fifths of what we were producing when we were at the height, is only stating what you know to be an obvious fact. I would not be exaggerating if I should say to you that conditions in Washington have not been satisfactory. I have on more than one occasion hinted at conditions there and have deplored some of the action which has been taken. I have nothing to say against any individual congressman. I fear that some of them have not been inspired by motives which are conducive to the best interests of the people of this country. I suspect politics has entered into the discussions to a degree that is unjustified from the standpoint of good reason or good morals. But those who have been guilty of any impropriety or of the exercise of their rights from bad or unworthy motives—as for them, they must take the responsibility. Some of them talk as though they would like to secure votes by leading a portion, perhaps a substantial portion, of the people of this country who

have less in resources than others to believe that they have been unjustly treated, to believe that they have not received their due proportion of the results of commerce and industry, and that if the speaker shall be elected or shall be retained in his present position, he will bring about something that will secure to these people who are possessed of less resources a position where they will be on a par and on an equality with others who have by economy and industry and good management been able to save something for themselves. But he does not say in the same breath what goes with it, from the standpoint of good logic or common decency, that if property or money or proceeds of activity are taken from a man who has saved what he has earned, that which he has, I mean without justice and without reason, they will soon get to a point where all the people including those who have little will have less, because prosperity will cease to exist and we shall be driven or shall drift into a position of industrial decay.

Stand or Fall Together

"They do not say that. They overlook, purposely or otherwise, the fact that the people of this country, taken as a whole, must stand or fall together; that if the country prospers, every one shall have the opportunity to prosper; if it does not prosper, that no one will have any chance for success. Sooner or later people will find out by the stern facts that such is the case.

"Now, gentlemen, in connection with that idea may I be bold enough or frank enough to call your attention to the fact that in our organization, in our institute, are represented both sides, those who produce and sell and those who produce and consume. This is at a time, as always, when there is such agitation as will likely bring about a depression in business and the purchasers are inclined to bring about a decrease in prices, if they possibly can. The purchaser has the right in every honest way to secure low prices if he can, as the producer has the right in every honest way and up to a reasonable and fair point to secure larger prices. But I want to say to the consumer and to the producer alike that if by selfishness either side assists in bringing about conditions which benefit one and prejudice the other, the final result will be disastrous to both. There can be no escape from that conclusion. And to you producers who are asked to sell for lower prices than you are justly entitled to, you have a perfect answer when you say to the consumer, you are just as much interested in your business, in what you do with the steel which you purchase, in the maintenance of fair and reasonable prices as the other side, the man or the institution from which you purchase. They must both go together. I do not object to fair prices, or reduction of prices when they are too high; I do not object to any kind of Governmental control or supervision which prevents imposition, which prevents a condition calculated to secure a monopoly or to enable the producer to impose upon the consumer. But when that is done it must be done by an impartial, competent authority, unprejudiced, unselfish and representing the Government itself. I do not object to the consumer arguing to the best of his ability for lower prices if he thinks it is for his interest and the interest of the country to have them lowered, if he thinks they are unreasonably high, when the high costs of production are taken into account. But I beg of him to remember, as I do both sides to remember, that there are others who are involved in the consideration of this question.

The Wage Question

"First of all, the wage earner himself. Just now there is some talk of reducing wage rates. Some reductions have been made. The air is filled with suggestions that others will be made. I have nothing to say to another man in regard to that. He knows his own business and own ability better than I do. But I do say this, let all of us remember that the costs of living are high.

"In that respect the public not engaged in certain lines has been imposed upon by the cupidity and the greed of some who on account of particular circumstances have an opportunity to oppress. Some rates are entirely out of line and fully unjustified. The costs of living are high, and so far as we can, let us keep the wages high enough to give the man a good and reasonable support. (Applause.)

"I am glad you loudly and vociferously applaud that sentiment. I know you believe it as we all do. Let us, so far as the steel industry is concerned, always do about the right thing. Let us be just to everyone, even though we are not treated fairly from Governmental authorities, from Congressional representatives or even from some parts of labor. Let us maintain a record and a reputation for intending to do about the fair thing, because thereby in the long run we do the very best thing for ourselves.

Bright Future for Country

"Now this country is not going into the hands of a receiver. There is a bright future for us. We are too rich, too strong, the necessity, the necessary demand for our products, is too great to permit the country for long to go without buying liberally of what we produce. We will get our fair share of business. Let us do what we can to continue prosperity. Let us do what we can to hold up the hand of that great and good man who at the present time honors us by being President of the United States. (Prolonged applause.)

"The long continued applause indicates how you feel toward President Coolidge, not because he is a Republican, not because a Republican is any better than a Democrat, for after all it is a question of what the man is, not what party he belongs to; but because he stands on the moral principles which alone make a country strong and vigorous and worthy of the high opinions of the people of this country and of all other countries. What a remarkable thing it is that during the last few weeks whenever there has been a primary election, even in the States of some who have heretofore been supposed to be remarkably and uninterruptedly popular and successful, the name of President Coolidge going before the people has secured the almost unanimous approval of those who voted. That means more than party, that means more than the occupancy of a high position by a candidate at the present time. It means that at this time in the history of the world, in the history of this country, we happen to have a man who never regards himself or his own interests when deciding or acting upon any material question that is presented. He looks to the best interests of his country. He would sacrifice himself and his chances if by so doing he believed he benefited the people as a whole. It is because he stands for moral principles, for honesty and integrity and frankness, and entertaining those sentiments, naturally he can afford to be courageous and outspoken and bold and invincible. And with him he has associates in his Cabinet who are of the very highest order of intelligence and morals.

The Public Interest

"And so, gentlemen of this industry, this great industry, let us take advantage of the disposition shown in Washington by those who have proved their integrity and their fairness by being liberally fair on our part. Let us never intentionally do or say anything that is opposed to the public interest. Let us never fail to respond to any invitation on the part of the people in Washington to furnish information and to guide our footsteps or to direct our thoughts and our language in favor of justice and propriety, the observance of the

laws and, above everything else, the observance of the principles of right and eternal justice.

"And so, gentlemen, with the opportunities of this country, with the surroundings which we are fortunate enough to have, let us be patient and at the same time courageous and hopeful and confident that ahead of us prosperity is surely presenting itself, and it is up to us to take advantage of it."

Iron and Steel Industry in the World War

Judge Gary Tells of Narrow Escape from Having the Business Taken Over by the Government—Distinguished Guests at Banquet

AT the banquet at the Commodore, Friday evening, Judge Gary gave an account of what was accomplished by the iron and steel industry during the Great War, from the time that President Wilson delivered his war speech to Congress and Mr. Baruch, soon after the United States entered the war, called upon the president of the institute and requested him to act as chairman and organize a committee of iron and steel masters to represent and mobilize the iron and steel industry of the United States in cooperation with the Council of National Defense in supplying the iron and steel necessary for war purposes. Judge Gary told about the different meetings that were held, of price regulation and of the narrow escape of the steel industries from being taken over by the Government. Upon the latter subject, he said:

"At one of the meetings in Washington, probably during the fall of 1917 or the early part of 1918, it was stated by Mr. Willard, the then acting chairman of the War Industries Board, that the Government was seriously considering the desirability of taking over the control and management of the total iron and steel industry of the United States as a guaranty of full production and distribution. This provoked expressions of surprise and objection, whereupon Mr. Willard, for his Board, promised that before action of this kind should be decided upon, the steel committee would be duly notified and given a full hearing. Subsequently the steel committee received notice to appear before the War Industries Board in Washington, at a time fixed in the notice, for consideration and decision of the subject of taking over the iron and steel business, as previously suggested. The committee appeared and a somewhat lengthy discussion took place. Several members of the Board argued in favor, and members of the steel committee against. The chairman, with earnestness and considerable feeling, though with no show of anger, spoke at length. Perhaps the same is true of other members of the committee. After referring, considerably in detail, to what the steel industry, under existing management, had done and was doing toward supplying steel for the military necessities of the United States and its associates, the argument of the chairman of the committee closed with substantially these words: "If you think, under Government management, better service will be rendered and you believe you can legally do it, you may undertake forcibly to secure the management of the steel business. You will never do it with the consent or approval of the owners of these properties and you will be held responsible, morally at least." Mr. Baruch at this time was chairman of the Board and through Mr. Brookings, who had never advocated the proposed procedure, the Board then took the matter to the President, who, after reading the proceedings written up, decided to let the matter rest, temporarily at least.

"The subject was never again broached to the steel committee. It has been reported that the Secretary of the Treasury had urged the President to take over the steel industry, though the steel committee does not claim to have knowledge of this action on the part of the Secretary. It is believed that the War Industries Board or the Council of National Defense did not originate or advocate the proposed governmental management. That the President was urged by some one and was partly committed to the scheme, and that the War Industries Board was honestly advocating the course suggested under instructions from the President, there can be little doubt. Imagine what would have been the consequences if the steel business had been taken over."

The guests of honor of the evening were: Hon. Honorio Pueyrredon, Ambassador of the Argentine to the United States, Hon. Donald MacKinnon, Commissioner, Commonwealth of Australia and Axel Fredrik Wahlberg, president Swedish Iron Masters Association. The three distinguished foreign representatives spoke with great earnestness in favor of increasing trade with the United States and of the maintenance of peace for all time. Mr. MacKinnon spoke particularly of the importations of iron, steel and machinery from the United States to Australia, including automobiles, which he said had increased from $77,000,000 in 1918, to $194,000,000 in 1922. Mr. Wahlberg said that the Iron and Steel Institute (of England) contemplates holding a meeting in 1925 at Stockholm. He hoped that many members of the American Iron and Steel Institute would attend.

Bernard M. Baruch Issues Statement

Says Judge Gary Is Inaccurate in His Version of the Plan to Have Government Take Over Iron and Steel Business

BERNARD M. BARUCH, chairman of the War Industries Board in war times, issued the following statement Saturday:

"I regret that the remarks of Judge Gary, before the American Iron and Steel Institute last night, bring to public attention unnecessarily a very unpleasant incident of the war in connection with that part of the steel industry for which he was the spokesman. I regret also that his statement contains many inaccuracies which the record controverts.

"In brief, Judge Gary is quoted as saying that, on the supposed instigation of William G. McAdoo, the War Industries Board proposed, 'in the fall of 1917 or the spring of 1918,' to take over the steel industry, that the War Industries Board was notified by the steel industry that it might do this by force, but never with the consent of the industry, that Robert S. Brookings, a member of the board, reported the situation to President Wilson, and that Mr. Wilson then decided to let the matter rest.

"Reading Judge Gary's recital, one would be led to assume that the steel industry, for no reason at all,

had been threatened with and finally saved from a gigantic communistic scheme. Here are the facts as I know them:

"Almost immediately after the declaration of war, at the request of the President, I met representatives of the steel companies in the office of Elbert H. Gary, 71 Broadway, New York City, more particularly in reference to the price of ship plates, which they fixed at 4½ cents a pound, assuring me they knew that would be satisfactory to the Government.

"I urged them not to insist upon that price, because it was too high and unfair in the circumstances. They could not see my point, although later in the evening I again met Judge Gary and made the same request, to which I got the same reply. I laid this information before the President and Mr. Denman, then chairman of the Shipping Board. At this period I was chairman of the Raw Materials section of the Council of National Defense, and was acting in that capacity.

First Federalization Move

"Following a conference at Washington in July, which both Judge Gary and I attended, it was decided to await the conclusion of an inquiry into prices of steel which the Federal Trade Commission was making. This brought about a meeting on Sept. 21 on the subject. Previously the War Industries Board had passed a resolution declaring that 'if the steel interests should not be willing to give their full cooperation because of the prices fixed, the War Industries Board would take the necessary steps to take over the steel plants.' This was the first official intimation of the 'Federalization' to which Judge Gary refers vaguely as having come 'in the fall of 1917 or the spring of 1918.'

"Based on his familiarity with conditions in the steel industry, and on the conclusions of the Federal Trade Commission inquiry, J. Leonard Replogle, Director of Steel for the War Industries Board, together with Alex Legge and L. I. Summers, also of the board, had prepared a schedule of prices for the guidance of the board prior to the meeting on Sept. 21.

"This schedule fixed the price of steel plates at 3 cents a pound, the necessity for this having been demonstrated by the fact that a few days previously a very large tonnage of steel plates was sold by one of the steel companies to one of the associated governments at 14 cents a pound, a hitherto unheard of price.

"This schedule, as prepared by Mr. Replogle and adopted by the War Industries Board (of which Judge Robert S. Lovett was then acting chairman) at a joint meeting of the War Industries Board and representatives of the steel industry, was submitted Sept. 21, 1917. At an all-day meeting the steel representatives, led by Judge Gary, stood out for a higher price than that fixed in the War Industries Board schedule. After adjournment Judge Gary suggested to me privately that we ought to get together on price. This we did that very night, but the price was practically that fixed in Mr. Replogle's schedule.

Temper of the Board

"The temper of the board had been shown by the resolution it adopted prior to the meeting of Sept. 21. In the course of various discussions I had told Judge Gary that my personal disposition was to have the Government take over the steel industry or any other industry that did not adopt a cooperating attitude on prices and regulations, and I had every authority for understanding that the Government would do this.

"While we had excellent cooperation on the part of the steel industry as a unit, there were some individuals in it who could not at first entirely subordinate commercialism to war needs. And the President informed me if the war program was being delayed or if it could be accelerated by putting any industry entirely under Government control this would be done. I did not think this necessary at that time and in this position I was supported by Mr. Replogle and all of my associates.

"The only other time the subject of federalization was discussed in my recollection was at a meeting of the 'War Cabinet' in Washington in the summer of 1918, subsequent to the conference in September, 1917. This was a general discussion of taking over all industries by the Government. On this occasion the steel industry, like all other industries, having accepted the price schedules and regulations of the War Industries Board, and being in satisfactory cooperation on that basis, I opposed any further steps along this line. By this time I had become chairman of the War Industries Board. I must say for the steel industry and Judge Gary that, after having finally been induced to cooperate they did it generously and thoroughly.

"To say the least, Judge Gary's recital of the situation is full of inaccuracies. If he, as he says, desires the matter to be one of 'permanent record,' it is extraordinary that he is not even informed as to the exact dates of the incidents he discusses.

"He does not remember, he says, whether they occurred in the fall of 1917 or the spring of 1918—not a very satisfactory basis for a permanent record. And he cites what he himself admits to be a mere 'report' about the supposed instigation of Mr. McAdoo. My relation of the facts is taken from the official records and is based on conversations which Judge Gary and I had on the subject.

McAdoo Not Involved

"So far as Mr. McAdoo is concerned, there is no basis whatever for Judge Gary's intimation that the federalization suggestion came from him. It arose as a result of a general demand, affecting all industries and predicated upon just such difficulties as the Government had with Judge Gary and those whom he represented at the beginning of the price-fixing era. I came to the conclusion then, and have since been strengthened in the belief, that in times of such emergency as war it is necessary and right to conscript men, money and materials for the national service. Call this what you will—federalization or nationalization—it does not mean permanent Government operation of industry, as Judge Gary's account would indicate that it means, requiring every unit of the nation to do its share of the public service when public safety is threatened.

"I should never have alluded to this matter if Judge Gary had not done so. But if we are to have a permanent record, let it be an accurate one."

Judge Gary Replies

Judge Gary, replying to the statement of Bernard M. Baruch, published on page 1559 of this issue of THE IRON AGE, has issued the following:

"It seems apparent that Mr. Baruch had not read my address in full. It was respectful, not controversial, and was accurate.

"The steel industry was loyal, energetic and efficient concerning the supply of steel for military purposes throughout the war. At first some of the members of the fraternity demanded prices that others believed were too high, and this was true at the beginning of

(*Concluded on page* 1614)

Technical Sessions

At the technical sessions seven papers, covering a wide range of subjects, were presented, but it is possible to print abstracts of only three of these in this issue, namely, "Hardened and Ground Rolls," by J. R. Adams, "The Cleaning of Blast Furnace Gas," by G. M. Hohl, and "Power Consumed in Rolling Steel," by Gordon Fox.

Abstracts of the four other papers will be published in THE IRON AGE, June 5. They are entitled "Manufacture of Steel for Ordnance Purposes," by Commander J. R. Rhodes; "Uniform Coking Coal and Blast Furnace Economy," by Walther Mathesius; "Selling Practice in the Steel Industry," by Ernest T. Weir; and "Composition of Raw Materials and Pig Iron Costs," by T. T. Read. Very few discussions of any of these papers were presented owing largely to lack of time, five of the papers being presented in the afternoon because the length of the morning session forced part of the morning program over to the afternoon session.

Hardened and Ground Rolls

BY J. R. ADAMS

J. R. ADAMS graduated from the University of Pennsylvania as chemical engineer in 1913; started with the Midvale Co. as research chemist in 1915; assistant superintendent of open-hearth department of the same company 1916 to 1918; assistant superintendent of research department of the same company 1918 to 1920; superintendent of research department of the same company from 1921 to the present time.

FOR the purpose of this paper hardened and ground rolls are considered as forged steel rolls, hardened and drawn, the drawing being insufficient to make the rolling surface machinable, so that it must be ground to be finished.

As hardened and ground rolls are principally used in cold rolling, the early histories of hardened and ground rolls and cold rolling are interwoven.

[A brief history of their development and use is here given.]

Hardened Steel and Chilled Iron Rolls Compared

Hardened and ground rolls differ from chilled iron rolls in that they have greater hardness, more homogeneous surface, greater strength and longer life. These advantages enable hardened and ground rolls to turn out a greater production than chilled iron rolls. A good surface can be obtained from some chilled iron rolls at the start of rolling, but it rapidly deteriorates. On the other hand, the high finish required is more easily obtained from hardened and ground rolls and can be maintained over a considerable period of time. They require less roll changing, fewer grindings, and usually the removal of less material by grinding to restore the surface, thus increasing their life. Hardened and ground rolls withstand greater reductions for a longer time than chilled iron rolls, without deterioration of surface or loss from breaking and spalling. In the more progressive mills, the hardened and ground roll is also gradually replacing the chilled iron roll for the roughing passes as well. When hardened and ground rolls are used in this work, greater reductions are made, the number of passes cut down, and a superior final finish may be obtained.

As the modern use of hardened and ground rolls developed, the manufacturers of them were compelled to abandon the plain carbon steels and adopt alloy steels to meet the more exacting requirements. Naturally, a number of different compositions have been used by various makers. The analyses of some of these, determined between 1900 and 1910, are as follows:

	C	Mn	Si	Cr	W	Ni
European roll	0.98	0.37	0.31	2.32	...	...
European roll	1.77	0.26	0.15	...	2.75	...
European roll	0.88	0.23	0.29	2.07	...	...
Unknown roll	0.68	0.25	0.17	2.09	...	...
Unknown roll	0.92	0.26	0.27	2.28	...	...
European roll	0.91	0.40	0.26	1.92	...	...
American roll	0.99	0.35	0.26	1.90	...	...
American roll	0.90	0.35	0.17	2.49	...	...
American roll	0.89	0.18	0.24	2.28	...	...
German roll	0.67	0.35	0.39	1.93	...	0.14

Since that time, roll manufacturers have adopted compositions that will more or less fall within the following:

C	Mn	Si	Cr.
0.70 to 1.25	0.20 to 0.40	0.15 to 0.30	1.50 to 2.50

We, however, do not believe the above is the last word in composition for rolls, and are continually experimenting to obtain a composition that will produce a better roll. From the viewpoint of excellence, the hardened and ground roll is a product typical of the best in the art of steel making. The alloy steel used is one of superlative purity, and excels in the qualities of strength and hardness. The raw materials used in melting are carefully selected and every care is exercised to melt and refine a steel of the highest quality.

Melting and Forging

Hardened and ground rolls are usually made from electric furnace, acid open-hearth, or crucible steel. The cleanliness of the surface and the final completion of the roll depend upon the character of the molten

Forging for a Hardened and Ground Roll

metal made, and the manner of pouring it, so that too much emphasis cannot be placed upon the cleanliness in both operations, or excessive loss due to imperfect surfaces will eventually occur. The ingots are usually cast in such a size that the reduction in forging is not less than 1:3.

High carbon chrome steel ingots are exceedingly sensitive, so are usually charged hot in the forging furnace, being sure there is no chance that the center is fluid. As the hazards of forging large masses of high carbon chrome steels are considerable, the heating must be done slowly and the ingot thoroughly soaked out before forging. The fewer heats necessary to finish the forging operation the better, and the furnace should be large enough to contain the entire forging at all times.

Annealing and Machining

The finished forgings are usually not allowed to become cold before annealing. They are charged immediately into an annealing furnace heated to a temperature below the critical. The annealing operations should be extra thorough and care should be taken that the forgings are held long enough above their critical temperature to remove completely any trace of forging structure. This is usually longer for chrome roll steel than ordinary steel.

too soft, and excessive wear will occur in use, defeating one of the objects in using a hardened and ground roll.

Hardening

The hardening to the maximum degree of a mass as large as even a small roll is no easy matter, and when this mass becomes as large as a roll 24 in. in diameter by 46 in. long in the body, the difficulties are considerable, to say the least. Long experience and the most careful supervision are required to be reasonably successful.

The hardening is carried out in various ways by different manufacturers. A water dip, either still or agitated, water spray or submerged spray are all used. The size, design and hardness desired all dictate the method that can be used successfully. Many large rolls cannot yet be quenched in a spray with consistent success, while the smallest rolls do not usually require spraying. The hardening to the maximum degree of a mass as large as even a small roll is no easy matter. The heating and quenching time for the various sizes of rolls, quenched by different methods, must be worked out experimentally with great exactness, in order to prevent breakage and obtain the maximum hardness.

After hardening, the strains must be relieved without materially decreasing the hardness of the roll. For

Hardened and Ground Rolls of Various Sizes

The beneficial results obtained by prolonged annealing were very forcibly brought home to us some time ago by a change in the annealing of the large roll forgings, which greatly reduced the loss in the hardening operation and the number of retreatments. In cooling from the annealing temperature, precautions must be taken to see that no strains are set up in the forgings and that they are soft enough to be readily machined.

After annealing, the forgings are preliminarily machined in heavy duty lathes, sufficient material being left above the finished size to allow for further heat treatment, and an axial hole bored through the center of the rolls to examine the interior for defects by means of a bore searcher. The machined surfaces should not be rough, lest the efficiency of the subsequent heat treatment be diminished.

As the annealed structure is one that does not best withstand the final drastic hardening, it is usually necessary to further heat treat the rolls before hardening. This treatment generally takes the form of one or more quenches and draws, depending upon the size and type of the roll. The quenching medium is usually oil, but some form of water quench may be used. A rapid quench is desirable to obtain a good structure, but the design of the roll must be considered, or breakage may result from too severe a quench, since the material is very susceptible to cracking. The drawing temperature is such as to leave the journals of the roll the proper hardness. If the draw is too high, the journals will be

certain purposes, it is not desirable or necessary to furnish rolls of the maximum hardness, in which case they can be given a low draw. Some rolls have to be finished with hardened journals, in which case it is necessary to harden them all over. This increases the hazard considerably, but it can be done, and a number of hard journal rolls are now made. After hardening and relieving the strains, the scleroscopic hardness of the rolls is determined for every inch on paths running the full length of the body.

Grinding

If the scleroscope indicates that the rolls are of uniform and proper hardness, they are sent to the grinding department.

Rolls that have been made from excellent steel and have come safely through all previous operations can be entirely ruined in the finish grinding by using improper wheels, speeds or cuts. The rough grinding should be done with coarse, soft, free-cutting wheels, kept well opened at all times. The finish grinding is done with harder wheels, but it is necessary to take lighter cuts. If too heavy cuts are taken with a fine hard wheel, small hairline cracks and pits will develop. It is best to remove all but the last few thousandths with the roughing wheel before applying the finishing wheel.

The finished surface is of great importance. In most cases rolls are furnished with a high finish,

although this is not necessary for some users, since they grind special crowns on the rolls before they put them in operation. Unless otherwise specified, rolls are usually ground straight and furnished with a silver mirror finish.

[A discussion of the uses of rolls is offered at this point.]

While the hardened and ground rolls do not lend themselves to operations where temperatures attained will destroy their hardness, there are many industries, other than strip steel rolling, in which the properties of strength, super-surface, hardness and long life of hardened and ground rolls are being used to advantage. Rolls are being successfully furnished to the paper industry, stationery manufacturers, tinning trade, jewelry trade, asbestos manufacturers. They are also being used for the cold rolling of nickel, gold, silver, platinum, zinc, brass, copper and foil. Large rolls with an engraved surface to produce a pattern on the rolled product have also been manufactured.

Discussion

F. C. Elger, metallurgist American Steel & Wire Co., referred to the great variation in rolls prepared for the rolling of cold strip steel. He found that on examination of a large number of such rolls the average amount of usage between dressings was about 13 days. Variations in the hardness of the surface of the roll, however, cause variations in the period over which the rolls can be used from as much as three months under particularly good conditions to as little as a single bundle of cold strip steel when the rolls are unduly soft.

Ordinarily each grinding of such a roll removes from its diameter from 0.008 to 0.011 in. This suffices to true up the roll. This is kept up for dressing after dressing until a point is reached well below the surface hardness. This dividing line appears to be at a scleroscope figure of about 90, compared with 100 to 105 in the initial hardened condition. When the figure gets below 85 the roll must be set aside for rehardening. This point is reached usually after the diameter has been reduced about ½ in.

One caution in the handling of such rolls was voiced in connection with putting it into the grinding machine for truing. Unless the necks are trued first from the centers it will be impossible to get a truly round roll by swinging it on the necks which have been worn by hard service. Once these necks are correctly trued up, however, they may be used as support for the roll in truing its surface.

The Cleaning of Blast Furnace Gas

BY G. M. HOHL

G. M. HOHL was graduated from Lafayette College in 1912 and attended the Massachusetts Institute of Technology the next year. He returned to that college after working with the Bethlehem Steel Co. from June, 1913, to September, 1914. He went back to Bethlehem in June, 1915, and has been there ever since, with the exception of four months from December, 1915, to April, 1916, when he was assistant superintendent of the Hokendauqua plant of the Thomas Iron Co. He did experimental work at the plant at Bethlehem until April, 1916, when he started in the blast furnace department. In June, 1918, he was made assistant superintendent, and in March, 1919, superintendent. He is also chairman of the blast furnace committee of the Bethlehem Corporation.

DURING the entire period of the development of the blast furnace to the size and capacities of the furnace of today, more attention was paid to the design and construction of the stack than to the auxiliary equipment.

The constant demand for higher blast temperature began a revolution in stove design and brought about the change in checker opening size from 9 x 4 in. to 4 x 4 in. or even smaller. For stoves with small checker opening to remain in service, clean gas is required; and this was one of the first causes for the demand for clean gas. The economical side, of burning gas correctly, and the studies and improvements that have resulted in obtaining the maximum efficiency from the gas, have nearly all come in this country during the past 15 years. The higher costs of fuel and labor and the sharpness of competition have forced managers to pay more attention to their plant heat balances, and the results of constant efforts to stop heat leaks are now apparent at most plants.

Savings from Clean Gas

The value of clean gas can be appreciated only by those who have operated with both dirty and clean gas. The most noticeable savings are:

Reduction in the cost of cleaning and repairing stoves.

Higher blast temperatures, resulting in lowered coke practice, increased output and cheaper pig iron.

Saving in gas used by stoves, leaving more gas available for boiler and gas engine use.

The heat economies possible by utilizing the sensible heat of the gas leaving the dust catcher have long been recognized. According to Richards and Johnston, about 11 to 12 per cent of the total heat generated within the furnace leaves as sensible heat in the top gases. More recently published calculations of Joseph, Royster and Kinney, using data obtained from 14 furnaces, show that the top gases carry out 10 to 12 per cent of the total furnace heat.

The problem of which style of gas washer or cleaner shall be used involves many factors besides the question of heat saving. The initial cost, the cost of operating, the recovery and disposal of the dust, the degree of cleanliness desired in the gas, the equipment already installed, the character of the raw materials used, and the location of the plant, all of these vary. The cost sheets, as usual, is the final judge.

Preliminary Cleaning

The preliminary cleaning of the gas is always done by one or two dust catchers, either alone or with a whirler of some type. The original dust catcher was simply an enlargement in the downcomer to allow the heavier particles of dust to settle. The average dust catcher today is about 25 ft. in diameter and 30 ft. high. Some are larger, and one with 40 ft. diameter is in use.

All preliminary cleaning is the application of one or more of the three basic principles of removing dust from gas, i.e., changing the direction of the gas, reducing the velocity, or the separation of dust by gravity or centrifugal force. There are several well known types. Large dust catchers, properly designed, can remove about 90 per cent of the dust from the entering gas, reducing the dust content of the exit gas to

2.75 to 5.00 gr. per cu. ft. The work of the primary washer or cleaner can be greatly lightened, by using the dust catcher to the best advantage.

After the preliminary cleaning, the gas is generally further cleaned by either a wet or dry cleaner. This is called the primary cleaner. At some plants all the gas from the furnaces is primary cleaned, at others only the gas for stove use.

[The author discusses at this point the various kinds of wet and dry cleaners with drawings and illustrations.]

Heat Saved by Dry Cleaned Gas

From the standpoint of heat economy alone, dry cleaning the gas is superior to wet washing. The sensible heat of the gas leaving the furnace is an item well worth saving.

There are more data available on the performance of wet washers than of the dry cleaners. In general the best wet washer, cleaning all the gas from a furnace, lowers the dust content to 0.15 to 0.25 gr. per cu. ft., and cools the gas from 4 to 10 deg. Fahr. above the temperature of the entering water. The water used is from 30 to 35 gal. per 1000 cu. ft. of gas cleaned, and the power consumption 0.04 kw. per 1000 cu. ft. of gas cleaned.

In the dry cleaner, the power consumption is low and is only needed by the rapping or shaking device. The Cottrell treater uses about 0.1 watt per 1000 cu. ft. of gas cleaned.

The labor cost of operating all cleaners is very nearly the same, one attendant per turn being required for each unit, or set of units.

Flue Dust as Washer Sludge

The flue dust in the outgoing water from wet washers represents a loss of 10 to 15 tons of 45 per cent iron bearing material every day. The early attempts to recover this were small basins through which the dirty water passed, allowing the dust to settle to the bottom. The sludge was periodically removed with a grab bucket or an overhead crane. The size of the settling basin was increased, as the recovery proved profitable, and at one plant eight of these basins each 120 ft. long by 40 ft. wide are used.

The latest development in sludge recovery has been the adoption of the Dorr thickener to this work. It has proved very satisfactory, over 95 per cent of the dust being recovered. The sludge from the thickener is pumped to the furnace skip, and dumped back into the furnace. The danger of stream pollution is thus avoided, in addition to the value of the dust recovered.

General Considerations

In choosing the type of washer or cleaner for a plant, the existing equipment and the raw materials used must be taken into account.

The size of the stove checkers should determine to what degree the gas should be cleaned. There is not much to be gained in cleaning the gas to 0.2 gr. per cu. ft., if the stoves all have 9 x 9 in. checkers and dirtier gas could be used.

There is not much difference in the price of any of the well known primary washers and cleaners. The operating cost of the dry cleaner is invariably lower than for washers, as less power and no water is required.

The ground space required for a dry cleaner is much more than for a washer. Some plants would have difficulty in finding room for a full size dry cleaner. Settling basins and Dorr thickeners also require considerable ground space, but these can be placed at some distance from the furnace and washer.

On the basis of heat economy, the dry cleaner has the advantage, provided there is a market for gas saved and the extra steam produced. This advantage increases with the cost of fuel at the plant.

Power Consumed in Rolling Steel

BY GORDON FOX

GORDON FOX graduated from University of Wisconsin 1908, electrical engineering course. From 1908 to 1913 he was connected with the General Electric Co. at Northern Works, Madison, Wis., and Fort Wayne Works; 1914 to 1916 with Mark Mfg. Co. at Evanston Works; 1916 to 1920, electrical engineer, Steel & Tube Co. of America, Indiana Harbor, Ind.; 1920 to 1924, electrical engineer, Freyn, Brassert & Co., Chicago. Mr. Fox has been connected with the designing and construction of a number of blast furnaces and other plants, and has contributed frequently to the technical press and engineering societies.

THE use of electric drive greatly facilitates the securing of power consumption data. In spite of this fact there has been published comparatively little specific information on this subject. Many mills secure only such data as is necessary for monthly cost distribution purposes. The possibilities for economies in power usage are not likely to be realized in the absence of complete and accurate information as to the results obtained. It is the experience of the writer that the cost of providing suitable metering equipment and obtaining sufficient records can be fully justified provided these records are analyzed and the data usefully applied. It is possible to accomplish many economies which fully justify the cost of their development. I would make this plea.

Ratio of Demand to Connected Load

It is of interest to note a material uniformity among plants in the matter of power consumed as related to horsepower of motors connected. Naturally, there is some variation between plants differing in size and character. Table A has been prepared presenting data as to the normal average power consumption of several plants of varied size and type.

The relation of power consumption to connected horsepower varies materially between departments in a given plant. Table B shows the relative power consumption of motors by departments in one plant. At the blast furnace, open-hearth and soaking pits, the drives are largely of the intermittently operated type and the use factor is relatively low. In the rolling mills the influence of the main drives leads to a higher use factor. At the pipe mills much of the machinery is of the steady running type and friction load is a ruling element, hence a relatively high use factor.

Power Consumed by Main Roll Drives

In rolling blooms, billets, slabs, sheet bars, plates, strips and similar shapes the metal is displaced largely

in the direction of rolling. It has been found that the power required for this class of rolling is a reasonably consistent result of several governing factors. In rolling special shapes in closed passes, such items as side displacement, indirect pressure, collar friction and end thrust complicate the problem to such an extent that no formulæ are applicable and determinations of power must be based on precedent.

Table A—Ratio of Consumption to Connected Load, by Plants

Character of Plant	Connected Hp. of Motors	Total Aver. Monthly Electric Consumption, Kwhr.	Ratio Aver. Kw. to Connected Hp., Per Cent
Merchant blast furnace: Exclusive of pumps..	2,672	242,000	13.9
Inclusive of pumps..	3,522	692,300	30.2
Coke ovens, blast furnaces, open-hearth and mills. Mills steam driven	13,584	1,550,000	17.6
Coke ovens, blast furnaces, open-hearths and mills. Mills part steam and part electric drive	71,314	8,960,000	19.3
Coke ovens, blast furnace, open-hearth and mills. Electric drive throughout	34,250	4,750,000	21.3
Open-hearth and mills. Mills part steam, part electric drive	13,740	1,456,000	16.3
Open-hearth and blooming mill. Electrically driven mill	7,203	1,110,000	22.4
Open-hearth, blooming mill and finishing mills, all electrically driven	34,924	5,506,800	24.3
Finishing mill producing hoop, hot and cold rolled, from billets. Electric drive throughout	5,403	1,098,000	31.5
Wrought iron mill. Busheling and piling. Steam driven squeezer and mills. Electrically driven auxiliaries. Lighting relatively large item...	721	107,500	37.0

Due to many variable factors, the power consumption of various mills is the kilowatt hours per ton. Such figures do not mean very much, however, unless qualified by the elongation. This measure is useful for comparing or estimating the power consumption of mills producing a given tonnage from and to stated dimensions. It is also useful as a check on the continuous capacity of motors installed.

In simple rolling the power requirement is a function of the volume of metal displaced. It may also be considered with reference to elongation, which is a related factor.

If all conditions remained the same throughout a simple rolling operation the power required per cubic inch of metal displaced would be a fixed quantity. Several changing conditions serve to modify this relation. Foremost among these is temperature. Cold rolling requires, roughly, twenty times the power of hot rolling per unit displacement.

The degree of temperature variation throughout a rolling operation depends upon the size and shape of the section, with particular reference to the area exposed per unit of volume. The time of exposure has a direct bearing. This is affected by the number of passes, the type of mill, the speed and the method of handling and reducing the steel.

Table B—Ratio of Consumption to Connected Load by Departments

	Ratio Aver. Kw. to Connected Hp., Per Cent
Blast furnace (exclusive of pumps)	10.3
Open-hearth	13.5
Soaking pits	10.5
Blooming mill	28.5
Billet mill	21.2
Plate mill	26.2
Skelp mill	24.9
Pipe mill	33.5

In the derivation of load charts for determination of power required for each pass and for combinations of passes in a proposed rolling schedule, curves showing variation in specific power consumption are of value. These curves show the variation in power demand per unit of volume displaced as the rolling proceeds. As the temperature of the steel is the most prominent determining factor, curves of specific power consumption are substantially the result of a combination of such curves as are given [in the paper], showing respectively the variation of demand with temperature and the variation of temperature with elongation or reduction in area.

Power Consumption versus Elongation

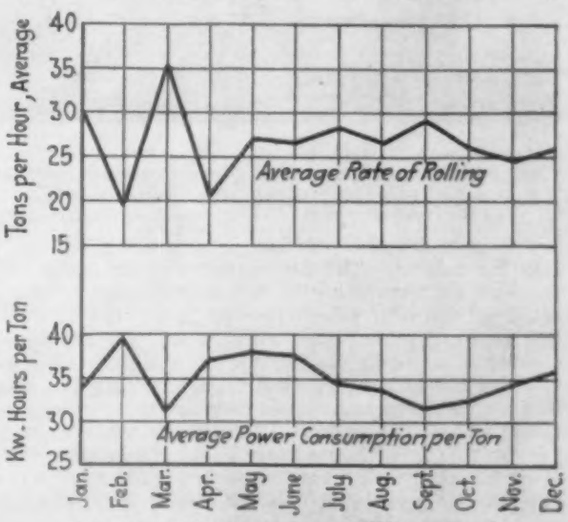
A very convenient measure of power consumption of various mills is the kilowatt hours per ton. Such figures do not mean very much, however, unless qualified by the elongation. This measure is useful for comparing or estimating the power consumption of mills producing a given tonnage from and to stated dimensions. It is also useful as a check on the continuous capacity of motors installed.

[The paper presents a number of curves showing the total power consumption as related to elongation in several types of mills, prepared from data obtained through the courtesy and cooperation of the management and the electrical departments of several mills.]

Due to many variable factors, but mainly due to variation of tonnage per unit of time, the points which establish these curves are more or less scattered, but lines may be drawn through them which are representative of average conditions. Theoretically and if the specific power consumption remained constant, it should require the same amount of power to elongate from 1 to 2 times, 2 to 4 times and 4 to 8 times, etc., the original length, since the volume displaced in each case is the same. The theory above outlined gives a logarithmic curve in which power consumed is proportional to the logarithm of the elongation.

Power Consumption versus Rate of Rolling

In general it may be said that, of the total power consumed in rolling steel, from 10 to 30 per cent is represented by friction load, that is, the equivalent of idling loss over the full period of time considered. The relative value of the friction load is a function of the tonnage per unit of time. Delays, an excess number of passes, and slow handling of the steel between passes, contribute to a relatively high frictional consumption.



Relation of Monthly Tonnage (1919) to Power Consumption of a Universal Plate Mill

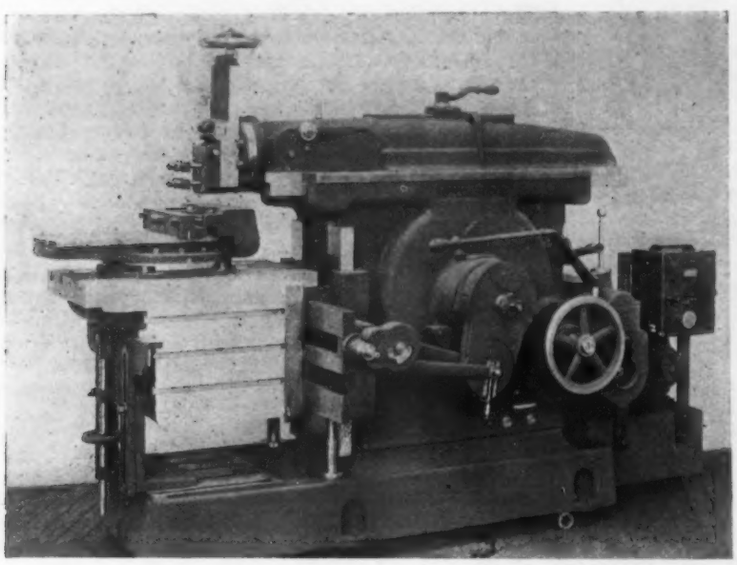
The power required for rolling steel may be considered as comprised of two main components. The idling friction component is taken as a constant quantity and is proportional to time. The rolling power component involves both the displacement of the metal and all other contributory items. This load is closely proportional to the tonnage produced (for a given rolling order). The total power consumption is the combination of these two components. It should be clearly apparent [from this curve] how decidedly the power consumption is influenced by the rate of rolling. This may be further enhanced by a higher unit cost of electric power for lesser quantity. From the point of view of power consumption it is highly desirable to keep a mill full.

To show further the influence of rate of output on power consumption per ton, there is shown in diagram the tonnage output of a universal plate mill by months over a year together with corresponding power data.

New 32-Inch Stockbridge Shaper

The Stockbridge Machine Co., Worcester, has placed on the market a new 32-in. heavy duty crank shaper, a conspicuous feature of which is the incorporation of a double bearing for the bull gear. Rigidity being of greatest importance in long stroke shapers, this requirement has been a foremost consideration in designing the new machine.

The bull gear in this shaper is carried between two bearings, the usual hub bearing on one side and an outer support or ring bearing on the opposite side. This outer bearing is on the inside of the column placed close up to the rocker arm and consists of a ring fitted into the column. The full diameter outer journal of the bull gear revolving in the ring bearing is lubricated by means of rollers running in an oil well. The bull gear and pinion have helical teeth. The additional rigidity obtained by the two bearings is emphasized as of value not only under heavy roughing cuts, but also in wide finishing cuts where freedom from chatter is essential.



Overhang of the Bull Gear, or Crank Wheel, Has Been Eliminated. The bull gear is carried between the usual hub bearing and an outer support or ring bearing on the opposite side. The additional rigidity by the use of the two bearings is of value in both roughing and finishing cuts

The ram is of box section and has square guides. Wear is taken up by two full length solid gibs. The ram can be positioned and the length of stroke adjusted without stopping the machine. Eight ram speeds, ranging from 6 to 92 strokes per minute, are provided. The speed box is of the selective sliding gear type with ball shift. Gears are of steel, heat treated, and the teeth are pointed to permit of easy shifting. The gears run in grease.

The head has a graduated swivel for setting at an angle, and is provided with a clapper box of improved design with a planer type solid binding clamp. The clapper has straps and bolts instead of the usual tool post. Power down-feed may be provided.

The crossrail, which is of the three-track type, is elevated by two screws. The saddle is held in position by two square taper gibs and a third gib is provided at the bottom to prevent lifting. The table has two working sides and may be conveniently removed for clamping work directly to the saddle. The top of the table is 19 x 32 in. and the depth 18 in. The table is bolted to and hooked over the saddle, an arrangement intended to take all the thrust of the cutting tool against the solid metal and relieve the knee bolts from strain.

The crossfeed operates only on the return of the ram and cannot be fed on the stroke. The feed is automatic and may be varied or reversed while the machine is in motion. Feeds per stroke range 0 to 5/16 in.

The machine is driven by a constant speed pulley, and starting and stopping is by means of a friction clutch and brake which are controlled by a convenient lever. For setting up work the ram may be moved back and forth by this control lever. A handwheel is also provided for fine settings. For motor drive a 7½ to 10 hp. 1700-to-1800-r.pm. constant-speed motor is recommended, and is mounted as shown. The working floor space required by the machine is 60 x 124 in.

New Motor-Driven Swing Frame Grinders

A line of direct-connected motor-driven swing frame grinding machines built to machine tool standards has been placed on the market by the Diamond Machine Co., Providence.

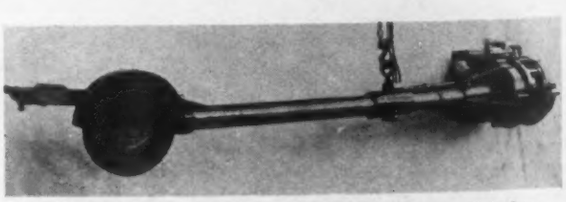
The general arrangement of machine may be noted from the accompanying illustration. Two sizes are available, for any current characteristics except 25 cycle; for the latter only one size may be obtained. For standard current one size has a 12 x 2 in. grinding wheel, driven by 3-hp., 1800-r.p.m. motor, the one size has a 12 x 2 in. grinding wheel, driven by 5-hp., 1200-r.p.m. motor. For 25 cycle current the machine is provided with a 14 x 2 in. wheel and a 3-hp., 1500-r.p.m. motor.

A standard, 8-ft. chain hoist arranged to hold the machine at its center of gravity is provided, this being emphasized as a feature permitting the machine to be raised or lowered readily as the grinding may necessitate. This support is balanced so that a minimum of effort is required to move or swing the machine. The machine may be hung from a hook in the ceiling or from a light jib crane from which the grinder may be swung over a wide area.

The motor is carried on a special end piece rigidly fastened to the hollow arm in which the driving shaft revolves. At the wheel head end there is a set of nickel steel spiral bevel gears for driving the wheel, these gears being fully inclosed and running in oil. The machine is equipped with ball bearings throughout, the bearings being of ample capacity and inclosed in dust proof housings.

A feature of the machine is the accessibility of the wheel, which may be removed by taking off the side plate on the safety guard and wheel flange. It is unnecessary to remove the spindle or expose the bearings, thus preventing the entrance of dirt into them. It is claimed that readjustment of bearings is not required.

The wheel head is arranged to swivel so that the wheel may be rotated 90 deg. each side of the vertical position independently of the rest of the machine. It may be fastened at any angle. The operator's handle is adjustable and may be fastened in any position from horizontal to an angle of 45 deg. The wheel guard has been designed to meet the specifications of the American Engineering Standards Committee.



Direct-Connected Motor-Driven Swing Frame Grinder. The wheel head swivels and the position of the operator's handle is adjustable. Push button control is a feature

Electrical control is a feature, the motor being operated by a push button control attached to the operator's handle within fingers' reach, and the machine may be started or stopped from the operator's working position. The starter is fastened directly to the motor

Sixth Sectional Meeting of Steel Treaters

One-Day Malleable Iron, High Power Magnification, Heat Treatment of Steel Dies Among Papers Presented at Moline, Ill.

THE American Society for Steel Treating held its sixth sectional meeting at Hotel LeClaire, Moline, Ill., May 22 and 23, under the auspices of the Tri-City Chapter. The registration was 200 and the banquet on the evening of May 22 was attended by over 300. The principal speaker at the dinner was Dr. George K. Burgess, director Bureau of Standards, Washington, and president of the society. With the aid of lantern slides he described the comprehensive ramifications of the work of his bureau. The address of welcome was by W. H. Stackhouse, general manager French & Hecht, Davenport, Iowa, who emphasized the increasing importance of greater technical proficiency in industry. The tri-cities, he pointed out, formerly consumed a great tonnage of steel and they will do so again. In the meantime the demand will be for better products and cheaper products and it is the mission of the technical man to aid in the attainment of those ends.

W. H. Eisenmann, secretary of the society, responded. The society, he asserted, is still in its infancy, but has shown remarkable growth. Starting four years ago with 200 members, it now has 29 chapters and a membership of 3200. William Butterworth, president Deere & Co., Moline, Ill., was toastmaster.

Friday was devoted to plant visitation. In the morning separate parties were escorted to various important industries on both sides of the Mississippi River and at noon a luncheon was held at the clubhouse of the Rock Island Arsenal Golf Club. Here Col. D. M. King, commandant, gave a brief talk on the arsenal and its history and pointed out that much of the progress in the heat treatment of steel during the past 40 years has been directly traceable to the development of arms and munitions. He called attention to the rivalry of the Army and Navy in the perfection of projectiles and armor plate. Once a projectile is developed to pierce the strongest armor plate, efforts are concentrated to make a plate to withstand the shell. The arsenal is located on an island, 900 acres in area, located in the Mississippi River, midway between Davenport on the Iowa side and Moline and Rock Island on the Illinois shore. Colonel King personally conducted the party through the shops of the arsenal, which during the war employed 17,000 people. The force is now reduced to 600, but facilities are now sufficient to take care of 30,000 operatives. A golf tournament was arranged for members of the society on the arsenal course.

Technical Sessions

The technical sessions were held on Thursday in the hall of the Moline Club. Dr. Burgess presided at the morning session, while C. H. Burgston of the Tri-Cities Chapter occupied the chair in the afternoon.

High Power Magnification

In a paper on "High Power Magnification in Metallography," R. G. Guthrie, metallurgist the Peoples Gas Light & Coke Co., Chicago, took the position that more can be seen at 5000 dia. than at 1000 dia. A photomicrograph at 500 diameters generally shows beautiful detail and fineness of general structure. It is, however, analogous to looking at a large gathering of small units at some great distance with the naked eye as compared with looking at the same gathering at a short distance. It is true that you will not see any more units at the shorter distance, but the ones you do see will be much more apparent.

Mr. Guthrie called attention to the fact that there are numerous ways of obtaining magnification of the same power and that a standardization of methods is in order. That steps toward standardization are now being taken was brought out in comments by Dr. Burgess mentioned elsewhere in this report. Mr. Guthrie's remarks were in part as follows:

> "Magnification of 500 dia. may be arrived at by using a 5 mm. objective with an ocular having an initial magnification of 2.6 and a 1000 mm. camera bellows extension, or it may be arrived at by using a 2 mm. oil immersion objective with the same ocular but having only a 450 mm. camera bellows extension, or it may be further arrived at with a 2.2 mm. objective using the same ocular and a 500 mm. camera bellows extension, or it may be arrived at by using a 4 mm. objective with a 6 dia. ocular and a camera bellows extension of 500 mm. Still further, it may be obtained by using an 8 mm. objective with a 10 dia. ocular and a camera bellows extension of 500 mm."
>
> "Obviously, something should be done to determine just what 500 dia. really does mean. It cannot be taken for granted that every metallographer will follow the principle of using the highest power objective together with the lowest power ocular and camera bellows extension for a given magnification because that would mean that practically all photomichographs above 450 dia. would be taken with a 2 mm. oil immersion objective. In fact there are so many ways to obtain a magnification of this power that it would be a very foolish thing to try to name all of them. Likewise it is entirely possible to take a photomicrograph of 2000 dia. in any one of 5 or 6 different ways using 3 or 4 different sizes of objectives."
>
> "It is no doubt true that, when an image is enlarged sufficiently to see all the detail present, further enlargement does not show any more than was there in the first instance, but in the ordinary field at low magnification, there are so many details of structure to be taken into consideration that all of us no doubt are missing some fundamental information there. Now, on the other hand, when these same fields are taken a little at a time and enlarged to a point where all their details are readily apparent, it is not likely that the interpretation will be confused, and it is my prediction that eventually it will be the practice of metallographers generally to examine all their samples, particularly the pearlites, at a low resolving power to get the perspective of the general structure of the piece in question and then to go to the higher power objectives to get specific information regarding certain areas, and finally resort to extreme magnification or enlargement of certain portions of these areas for their ultimate information regarding the material."

In commenting on Mr. Guthrie's paper Dr. Burgess said that Dr. McAdam, U. S. Navy, Annapolis, Md., in an investigation of sulphur in steel found that 5000-dia. magnification gives more illuminating results than lower magnification. The results of Dr. McAdam's studies are to be presented in a paper before the American Society of Testing Materials at its meeting next month. Incidentally, Dr. Burgess called attention to the fact that that society is now working on the standardization of metallographic practice. This is necessary because the appearance of metallographs of the same magnification are not the same when different illuminations are used.

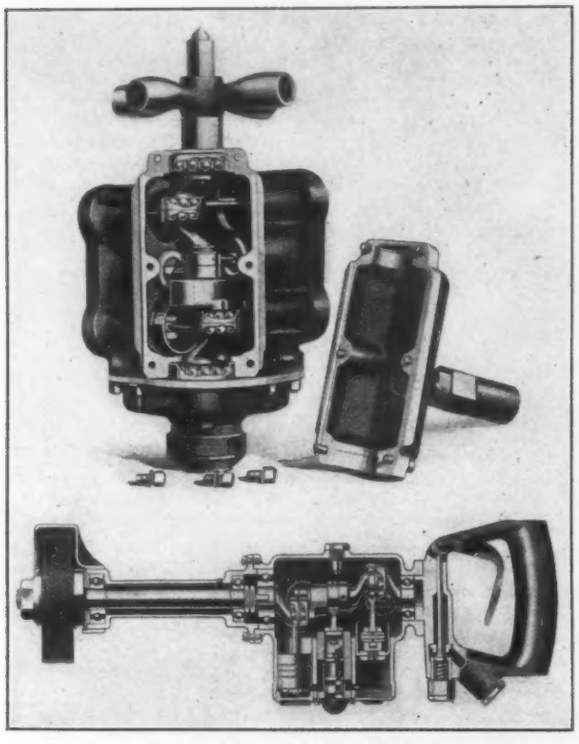
J. H. Nelson, metallurgist Wyman Gordon Co., Worcester, Mass., raised the interesting question whether high power magnification will enable one to distinguish between good and poor izod steel. Acid open-hearth steel which has a poor izod value, becomes a good izod steel when quenched at 1030 deg. Fahr.

(*Continued on page* 1615)

Ball Bearings a Feature of New Pneumatic Motor and Portable Grinder

A new pneumatic motor for operating portable drilling and other tools and designed to meet the exacting requirements of railroad work, and a new portable pneumatic grinding machine have been brought out by the Cleveland Pneumatic Tool Co., Cleveland. The outstanding feature of both the motor and the grinding machine is that both are provided with ball bearings.

The pneumatic motor is made in plain and compound-geared types. It is of the four-cylinder type, having four single-acting pistons connected to opposite wrists of a double-throw crank. These wrists are grooved, hardened and ground, forming an inner ball race. The four connecting rods are enlarged at their end into a ring end of sufficient size to be strung on to



The Arrangement of the Ball Bearings In the Pneumatic Motor and the Portable Pneumatic Grinder May Be Seen In the Upper and Lower Views, Respectively

the end of the crank. The inside of the ring is machined to form the outer ball race. After the connecting rods are placed in position on the crank the balls are inserted and are retained in position by a spring ring retainer.

The pistons are screwed to the piston sockets, which in turn are attached to the connecting rods by a floating wrist pin which has oil holes for lubrication. The main valves are of the solid piston type and are operated from eccentrics on the crankshaft. They are placed between each set of cylinders from which they are separated only by a thin wall in which air ports are provided. The live air is, therefore, injected almost instantly into the piston chamber, assuring, it is claimed, quick motor action and conserving air. It is stated that on account of the reduction in friction through the use of ball bearings and the added power gained through quick delivery of the air to the pistons a very high motor speed and high drilling capacity is obtained.

The bearings on the crank and connecting rods as well as rods and pistons run in lubricant. The gears also run in lubricant. The gear chambers open directly into the crank case, which is filled with lubricant and is so constructed that lubricant is not driven out when the motor is in action.

The portable pneumatic grinding machine has an arbor or extension covered by a housing which is used as a forward handle. The arbor is connected directly to the crank as shown in the illustration, and is mounted on annular ball bearings at both ends, the same as the driving crank. The single-piece connecting rods contain ball races, which operate directly on the crank. These races as well as the annular ball bearings on the crank and arbor bearings have continuous lubrication both in the crank chamber and in the forward quill housing. All the revolving parts run in lubricant.

The body is split at the center, which permits the removal of the crank assembly without disconnecting the pistons or valves from the crank. The piston cups are screwed to the piston sockets and reinforced by a lock nut at the base of each cup. The connecting rods are attached to the piston sockets by a floating wrist pin, which is perforated for lubrication.

Four types of throttle handles are available, these being the inclosed type with outside or inside throttle levers, a straight handle with snap throttle lever and a straight handle with twist throttle sleeve. The machine is made in two sizes, one weighing 12 lb. having a 6-in. emery wheel and a speed of 4600 r.p.m., and the other weighing 21 lb. having an 8- or 10-in. emery wheel and a speed of 3600 r.p.m. Both the motor and the grinder will be shown at the Railway Supply Association convention at Atlantic City, June 11-18.

Iron and Steel Production in Canada

The production of pig iron and ferroalloys in Canada in April set a new high record for the current year, with a total of 86,795 long tons. The output of pig iron of all grades amounted to 83,875 tons, an increase of 8 per cent over that of March. Malleable iron, which had not been reported since last January, was again listed, the production amounting to 2,817 tons. The output of foundry iron declined 44 per cent as compared with the previous month, 15,855 tons being reported for April. The production of pig iron for the first four months of this year was 285,155 long tons, and was the highest record reported since 1919. In the first four months of 1923 the output reached a total of 234,000 tons, which compares with 141,000 tons in 1922 and 198,000 tons in 1921.

Steel ingots and castings reflected the high output of pig iron by advancing to 104,162 long tons, or an increase of 9.7 per cent over the output reported for March when 94,962 tons were made. The rise was due to the increased production of ingots, which amounted to 100,324 long tons, or 10 per cent greater than the 91,011 tons reported for the previous month. The ingots produced were all for the further use of the producing firms, and with the exception of 60 tons of alloy ingots, consisted entirely of the basic open-hearth grade. The output of 3,838 tons of steel castings during April marked a slight decline from the 3,951 tons reported in March.

Officers for New York Steel Treaters

The New York chapter of the American Society for Steel Treating, at its regular May meeting, Wednesday evening, May 21, elected the following officers for the ensuing year:

Chairman: E. E. Thum, Linde Air Products Co.

Vice-chairman: J. O. Rinek, Crucible Steel Co. of America.

Secretary-treasurer: T. N. Holden, Jr., E. E. Bliss Co.

Executive committee: C. H. McKnight, International Nickel Co.; C. H. Von Schlutter, Firth Sterling Steel Co.; E. F. Cone, THE IRON AGE; H. C. Griswold, Crucible Steel Co. of America; E. P. Gaffney, Wheelock Lovejoy Steel Co.

The principal speaker of the evening was A. H. d'Arcambal, metallurgist Pratt & Whitney Co., Hartford, Conn., who discussed "Carbon Tool Steel and High-Speed Steels in the Manufacture of Small Tools." Mr. d'Arcambal presented a large number of samples of various good and bad tools. His address was an elaboration, with some additions, of his paper before the Fifth Sectional Meeting of the Society at Rochester, Feb. 28. A somewhat detailed report of that address was published in THE IRON AGE, March 6.

Purchasing Agents Discuss Contracts

Animated Expressions of Opinions at Boston Meeting of National Association—Fuel Supplies and Costs Among the Subjects Considered—Unusually Large Attendance

THE ninth annual International Purchasing Agents' convention and informashow under the auspices of the National Association of Purchasing Agents, held in Boston during the week of May 19, was unusual, if for no other reason than it was the largest meeting of its kind ever conducted, not only from the viewpoint of attendance, but in exhibits and work accomplished as an organization. It was expected that approximately 2000 delegates from all parts of the United States and Canada would attend, whereas nearly 3000 participated.

During the past year it seemed advisable for the association to work through commodity committees. With this in mind it was decided to appoint fewer committees and only those which would be able to function. Thus the machinery of the convention, although extensive, worked more smoothly than heretofore. The group dinners and conferences were much more largely attended, and discussion was freer than at previous similar conventions. In addition, members of the association were given greater opportunity to inspect exhibits and talk with those in charge, a feature often lacking in conventions.

Committees appointed were: Fuel, paper, iron and steel, lumber, education, centralized purchasing, chemical, public utilities, and specifications. A great amount of work was accomplished during the year by the various committees as was attested at the convention.

Of the various committees, that of iron and steel was, perhaps, the most active during the past year. It presented many subjects for discussion at the convention, including a uniform specification of iron and steel scrap, a standardized purchase contract form for iron and steel scrap, tentative specifications on tool steel as proposed by the American Society for Testing Materials, specifications for wire rope as proposed by the Federal specifications board, specifications for ferromolybdenum, ferrotitanium, manganese ore, ferrosilicon as submitted by the Federal specification board, as well as certain considerations of cold-rolled strip steel and bar extras. Numerous suggestions were appended to the aforementioned specifications, all of them making clearer what the iron and steel committee has in mind. Each subject will have to come up before the convention at its next annual meeting.

In addition, competent authorities gave helpful talks on various phases of the iron and steel and allied industries with a view to enlightening the purchasing agents on production methods and conditions by which these industries are confronted. The subject of contracts was, perhaps, the paramount one. At least, it came up in the various conferences more often than any other.

Prediction as to Furnace Position

During one of these conferences it was stated that in the opinion of one speaker, John A. Penton, chairman Penton Publishing Co., Cleveland, any specification such as suggested would not be recognized by furnaces because it touched too closely on the commercial activities of the iron and steel makers. The same speaker bitterly attacked the purchasing agent who makes it a practice to crawl out of a contract when the market price for what he has purchased has declined.

These statements brought forth sharp protests. The attention of Mr. Penton was drawn to the policy of purchasing agent members of the association as to the validity of any contract entered into. During the discussion numerous assertions were made by purchasing agents that steel mills did not live up to their contracts; that often when steel was purchased and the market advanced it was impossible to secure low priced goods; that representatives of the steel mills solicited high priced tonnages to even up on low price tonnages previously bought.

Frank Purnell, vice-president Youngstown Sheet & Tube Co., was asked to explain the attitude of the steel mills on the latter point. In reply he said: "It was one of the easiest questions asked. In the first place, I seriously doubt if any official of any steel company would authorize solicitation of high priced tonnages from any purchaser covered on low priced goods. There might be a sales manager here and there who would sanction such solicitation, but not on authority of company officials. When a salesman puts any such proposition up to you, it's all bunk. And I cannot comprehend how any intelligent purchasing agent falls for such bunk." On the other hand, Mr. Purcell declared that approximately 75 per cent of the buyers of steel look for and expect reductions in contract prices when the market goes against them. In his opinion the steel mills generally voluntarily make such reductions.

Too Much Gossip

A great deal of harm has been done business by gossip, according to Mr. Purnell, and he strongly urged purchasing agents to refrain from such practice. As for the soldier bonus, it has passed and business should make the best of it. Too much has been said regarding the poor farmer, is the belief of Mr. Purnell. "Everybody is anxious to help the farmer. The Government has no more right to do so than it has to help the iron and steel industry, and it is a well recognized fact that the iron and steel industry does not expect any Governmental help."

"A few of the steel companies are reasonably successful," he said. "Some of the largest of them do not pay dividends. The ratio of turnover to capital invested is about once in 18 to 20 months. Competitive conditions make frequent changes in equipment and plant layout necessary. It is because money is put back into steel plants and because stockholders often do not receive dividends earned that the steel mills are able to sell steel as cheaply as they do.

"I am a great believer in the turning over of steel plants to the buyer. I believe the steel mill should say to the buyer, 'Here is our plant, now what can we do for you?' It is the only way for the buyer and seller to get along peacefully." Mr. Purnell went on record as in favor of any contract that would draw the two parties together.

Contract Respected

In the discussion following Mr. Purnell's address, it was brought out by several purchasing agents that in their opinion the average pig iron contract was the most respected among buyers. The buyers expected to and did take in every pound of iron called for in the contract, and the furnaces expected and did deliver every pound. The furnaces also have a standing among buyers as to deliveries of product as specified. It was as frequently stated that buyers in making a steel contract usually bought more stock than probably would be required, knowing that if the material was not specified, it would be automatically canceled at the expiration of the contract date.

"What the Purchasing Agent Should Consider in Buying Pig Iron" was discussed by E. J. Lowry, metallurgist at Hickman, Williams Co., Chicago. Aside from price, he stated, the average purchasing agent governs his purchase of iron entirely on analysis. There

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Triple Supply and Machinery Conventions

Fewer Sizes and Varieties of Products Advocated—Suggested Classification for Used Tools—Excessive "Service" Demands and Factory Cooperation with Salesmen

WITH a registered attendance of over 800, or the largest in the history of the associations, the triple convention of the National Supply and Machinery Dealers' Association, the American Supply and Machinery Manufacturers' Association and the Southern Supply and Machinery Dealers' Association was held in Cleveland at the Hotel Cleveland, May 19, 20 and 21. Each of the three organizations held its separate meeting during the forenoons and there were joint afternoon sessions. In addition, the machine tool section of the National association held two sessions.

Various problems relating to the manufacture and distribution of mill supplies and machine tools were discussed. Among outstanding features of the combined meetings were the contention by manufacturers that jobbers should uphold prices and make a fair profit, and the condemnation of partial jobbing, which representatives of the two dealers' associations claimed is being practiced by some manufacturers. The subjects of cash discount and simplification were discussed at considerable length. In the separate sessions of the individual associations the simplification movement received considerable attention, also the excessive demands made upon jobbers by their trade, resulting in narrowing margins of profit. The advantage of specialty salesmen and the value of factory aid in reinforcing the efforts of the general machinery salesman came in for discussion and not a little was said of the need of more highly trained salesmen.

Combined Sessions Develop Variant Interests

THE first session of the combined meeting was presided over by Dixon C. Williams, Chicago Nipple Mfg. Co., Chicago. The speaker briefly declared that fundamentally everything in this country is sound, but that members must watch their credits and their cash discounts and must pay more attention to the cost of doing business. It was generally agreed that a rigid policy is called for in dealing with cash discounts, 2 per cent for cash in 10 days and 30 days net being accepted as the general practice. T. James Fernley, advisory secretary of the National association, summarizing the consensus of opinion, declared that those who do not live up to the terms of the contract should not be permitted the privilege of a cash discount.

For Better Knowledge of Costs

Alvin Smith, secretary-treasurer of the Southern association, read a paper submitted by C. Leary, Grinnel Co., which dwelt on the cost of doing business among the mill supply distributers. The data presented were secured from the files of the National association and from investigations among the members. It was brought out in the subsequent discussion that adequate cost data were not always available and this lack contributed to the failure to make a profit.

Simplification of mill supply lines as the first definite step toward reducing the cost of doing business was advocated by W. J. Radcliffe, president of the National Association. This, he said, would help both the maker and distributer. Closer study of definite operating costs instead of working from misleading general averages was advised by J. H. McKinnon, Cameron & Barclay Co., Jacksonville, Fla. Such a study would tend to reduce price cutting, another member suggested. Wider sales margins were also suggested. One speaker declared jobbers failed to make a profit because they failed to maintain prices. This was disputed by another speaker who declared that partial jobbing by manufacturers was to blame.

The second combined session Monday was presided over by Irving W. Lemaux, Indianapolis Brush & Broom Mfg. Co., Indianapolis, Ind. L. P. Ayres, vice-president

Left to Right: George Fernley, secretary and treasurer, National Supply and Machinery Dealers Association; T. J. Fernley, advisory secretary and treasurer; B. H. Ackles, president; E. P. Wells, second vice-president; W. J. Radcliffe, retiring president

Cleveland Trust Co., and connected with the Dawes reparation committee, spoke on conditions in Germany and the Dawes plan. Referring to the proposed new German bank, Mr. Ayres said that American bankers should insist upon a gold basis, priority of the bank's bonds and competent authority to determine when and how payments should be made.

Robert S. Binkerd, vice-chairman Eastern Railroad Presidents' Conference, discussed the present railroad situation, maintaining that the present freight rates are low considering the service rendered. J. L. Pitts, Brown-Roberts Hardware & Supply Co., Alexandria, La., declared that a company that puts soul into its business and renders proper service will hold its customers and secure new accounts but cannot do this through price cutting. Charles W. Beaver, Yale & Towne Mfg. Co., Stamford, Conn., declared that consistently good service and the elimination of greed are the first requisites for holding trade and that business secured by price cutting will not stay.

Simplification and Standardization

S. Horace Disston, Disston & Sons, Philadelphia, was the chairman of the first combined session of Tuesday. The principal speaker was A. E. Foote, of the Department of Commerce, who talked on simplification or the reduction of sizes and varieties of products, and illustrated his address with lantern slides. He offered the cooperation of his department to any firms or groups facing such industrial waste as he pictured. James Bigg, Hardwicke-Etter Co., Sherman, Tex., spoke interestingly on "Business Sense." J. G. Belding, Lombard Iron Works & Supply Co., Augusta, Ga., urged that the purchasing agent in the supply and machinery business study the market, give salesmen the opportunity to explain and present their lines and consider the salesmen's time as valuable as his own.

John A. Beynon, Dodge Mfg. Co., New York, presided at the second combined session Tuesday. An address was made by William Staniar, E. I. duPont de Nemours & Co., Wilmington, Del., which gave the engineers' viewpoint of the standardization of belting and transmission machinery. He told of the technical research being conducted by his company to determine the most efficient thickness and width of belting. Alvin Smith advocated standardization of sizes to reduce belting stocks and increase turnover. He urged the distribution of belting through dealers and denounced an alleged practice of stocking the dealer and then underselling him to his regular customers.

Dealers and National Advertising

Charles W. Beaver was chairman of the last joint session. In discussing the question whether national advertising benefits the dealers, Charles H. Stebbins, Jefferson Union Co., Lexington, Mass., said that his experience as a salesman led him to believe that nationally advertised goods cost the dealer less to sell because of a decrease in sales resistance. He questioned the opinion that such merchandise was usually subjected to price cutting and said if that were the case the manufacturers could prevent cutting by the utilization of reputable jobbing facilities. Mason Britton, McGraw-Hill Co., New York, gave a lantern slide talk on "The Buying Structure of Industry."

H. W. Geller, Geller, Ward & Hasner Hardware Co., St. Louis, advised the three associations to hold their next meeting in his city. If St. Louis is not selected next year he extended the invitation for 1926. Atlanta, Ga., was also a bidder for the 1925 meeting. The place will be selected by letter ballot.

National Supply and Machinery Dealers' Association

THE first session of the National Supply and Machinery Dealers' Association, Tuesday morning, May 20, was opened with the annual address of President W. J. Radcliffe, E. A. Kinsey Co., Cincinnati. Discussing business conditions, he predicted that building and construction work would be maintained at satisfactory levels for some time to come, even though the building shortage is gradually disappearing. He believed railroad purchases will be of large proportion if the railroads are assured a fair return. The automobile industry seems to have reached a capacity in excess of current requirements. Mr. Radcliffe declared that the activities now most depended on cannot be expected to continue their buying and expanding indefinitely and that other industries must be developed to supplement them. He predicted that changes in manufacturing and distribution will be seen to a greater extent in the future than in the past.

Excessive "Service" Demands

The speaker held that there is an increasing demand from jobbers' customers for what is called service, a word still greatly abused. The average distributer is rendering service when orders are given prompt attention and shipped expeditiously. During the past few years there has been a tendency to stretch the word "service" to make it cover many wasteful and extravagant practices. Buyers desiring to keep low inventories have carried this policy to an extreme and as a result have called upon the distributers of supplies to render not only their usual prompt service, but extraordinary service such as the delivery by truck of small items of little value at a great distance on short notice. The president believed this matter is one that should be given careful consideration during the convention, and if there are any ways in which some of the wasteful practices which have crept into their business can be eliminated or minimized, it is the duty of the association to discover them.

Mr. Radcliffe referred to an investigation into the question of overhead expense and turnover which the association has conducted. He said that the present high overhead is not only caused by the increased cost of living, necessitating higher salaries and wages, but by higher rentals, higher freights and higher taxes. These factors, coupled with the extravagant service demanded by customers, places the overhead on a basis which makes it exceedingly difficult to conduct business profitably. He made two suggestions: First, to conduct business in a manner that will cover the overhead and leave proper remuneration, and, second, reduce expenses. Most of the members had tried to apply both remedies and he hoped that they would go back home with new ideas as to how they can conduct the distribution of supplies along efficient, economical and profitable lines.

Reducing Varieties and Sizes

Another subject the president referred to was the work of Secretary Hoover looking to the elimination of unnecessary sizes, styles and varieties of products. Some groups of manufacturers have already started to simplify their lines and he hoped others would undertake this work. He felt that they could not urge too strongly that manufacturers cut down the great variety of sizes which distributors are forced to carry. He declared that nothing would do more to lessen the overhead expense and to increase turnover than the elimination of unnecessary sizes.

He also suggested that the use of the term "dealer" be discouraged and the term distributer be substituted as more accurately describing the character of the jobber's business. He held that jobbers are not traders who buy advantageously to sell at a favorable turn of

the market, but distributers who perform a useful and economical service by purchasing large quantities from manufacturers and carrying these supplies in stock awaiting requirements of consumers.

Mr. Radcliffe referred briefly to the subject of taxation, declaring the views of Secretary Mellon and President Coolidge are sound, and regretting the departure from them in the Senate bill.

Activities of the association during the year were reviewed in the annual report of T. James Fernley, advisory secretary-treasurer. He stated that investigation showed that over 3 per cent of the goods shipped by members are returned. This subject should receive careful attention as the return of goods increases distribution cost.

Changes in Trade Practice

Attention was called to the work of the division of simplified practices of the Department of Commerce. Definite action has been taken in approving elimination schedules of files and forged tools and a number of other lines are under consideration. Adoption of the practices followed by some members in charging interest on past due accounts was recommended to others.

Attention was called to the fact that some manufacturers have discontinued freight allowances and instead of equalizing freight with competitors are now selling f.o.b. factory. It is suggested that the members request manufacturers to reinstate freight allowances, thus placing distributers in all parts of the country on a more favorable basis. The members were urged to request manufacturers who were not doing so to allow a 2 per cent cash discount; also to try to induce manufacturers having low price lists and small discounts to make changes in their system of quoting. The report called attention to a compilation of overhead expense made during the year, which was a subject of a discussion later. In addition a chart was presented giving facts as to methods used in compensating salesmen and other data.

Specialization in Sales

In discussing the steps to be taken to place a supply business on a profitable basis B. H. Ackles, T. B. Rayl Co., Detroit, recommended that salesmen showing an adaptability in selling certain items should be urged to specialize and take charge of the sales of those lines. In this way, he said, the salesmen would have more personal interest in increasing sales in lines on which they specialize.

The necessity of securing proper profit on small items was emphasized by L. D. Gray, Irving D. Booth, Inc., Elmira, N. Y.; George Puchta, Queen City Supply Co., Cincinnati, and R. O. Rodgers, Pittsburgh Gage & Supply Co., Pittsburgh. Another speaker declared that factories ordering a single low priced item expected the same prompt delivery service from the mill supply house that a woman gets from a department store.

Change in Association Name

At the opening of the session Wednesday the suggestion that the name of the organization be changed to the National Supply and Machinery Distributers' Association was discussed and the change met with approval, although H. W. Strong, of Strong, Carlisle & Hammond Co., Cleveland, expressed the opinion that the name "dealer" is more appropriate, as it describes the function of the organization which he said occupies the one step between the manufacturer and consumer. It was also suggested that should the name be changed the Southern Supply and Machinery Dealers' Association should make a similar change in its name. It was finally decided to send a questionnaire to the members, and that the proposed change be decided by the vote. Later the Southern Association approved the change in name and decided to submit the matter to a referendum.

Secretary-Treasurer Fernley suggested the establishment of a research bureau to conduct a research of overhead expenses and other matters, and the suggestion was adopted.

Chairman Radcliffe called attention to the code of business ethics recently adopted by the Chamber of Commerce of the United States and favored having the association take this matter up later.

Developing Salesmen

The methods used to interest young men in the supply business brought out much discussion, showing that this topic is regarded as important. W. D. Taylor, president George Worthington Co., Cleveland, emphasized the training of salesmen. He found that the amount of pay is the chief thing of interest to young men these days, and believed if an employer could get their cooperation he would secure a better lot of men to develop into salesmen. If more interest were taken in individuals there would be less labor turnover.

George Puchta, Queen City Supply Co., Cincinnati, told of his company's salesmen's meetings every Saturday morning, in which there were talks to the salesmen. For the rest of the force a school is conducted every Friday evening and the plan is showing good results. F. Alexander Chandler, Chandler & Farquhar Co., Boston, thought a plan followed in some other lines of taking young men who are attending school and employing them part time afternoons and Saturdays would prove successful. In their store they had conducted classes which were given the Sheldon course and this plan had worked well.

The assistance rendered by the association in the collection of delinquent accounts was outlined by the secretary-treasurer, who said that the plan had saved the members thousands of dollars that would otherwise have gone to collection agencies.

In discussing the question of inducing purchasing departments to recognize service as being more important than price, W. A. Griffin, Ward Supply Co., South Brownsville, Pa., complained that often when additional commissions are secured from manufacturers weak-kneed distributers immediately give them away to the consumer. He referred to the "price baiting" policy of many manufacturers who stabilize the market on their own products through their sales department while their purchasing department demoralizes the market in beating down prices. He declared this inconsistent policy should be abolished.

Specialty Salesmen

Considerable interest was aroused in a discussion of the value of specialty salesmen; it was led by G. Cheston Carey, Carey Machinery & Supply Co., Baltimore. He declared that it was natural for a salesman to deteriorate into an order taker when he carries a great many lines. His company has a system of specializing on certain lines during certain months. Each salesman pushes that particular line during the one month and this has resulted in an increase in sales. He believed mill supply houses should put special salesmen on their big lines and that specialty salesmen are an asset to a distributing house that defies competition. His company is now developing two specialty salesmen, one man selling pumps and air compressors and the other material handling equipment.

W. D. Taylor said that the discussion again pointed to the necessity of having good salesmen. He believes that specialty salesmen in many cases are not successful. Temporarily they might be all right, but in the long run he did not think that the plan would pay. After the discussion on the advantage of having men come from the factory to help out the salesmen, a vote showed that 80 per cent of those voting believed that such specialty salesmen from the factory are a real help.

As a token of esteem the members presented to W. J. Radcliffe, the retiring president, a silver punch bowl.

Appropriate resolutions were adopted respecting the death of E. E. Strong, president of the Strong, Carlisle & Hammond Co., Cleveland, first president and founder of the association, and the death of Thomas H. Fernley, the secretary, who died within the year.

Officers were elected as follows: President, B. H.

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Urges Elimination of Pittsburgh Basing

Attorney Steinhauer of Federal Trade Commission Attacks System—Brief of Western States Declares It Is Not Charged Steel Corporation Is a Monopoly

WASHINGTON, May 26.—Vigorously assailing the Pittsburgh plus system of quoting prices on steel, Attorney K. E. Steinhauer of the Federal Trade Commission, in his brief filed last week, strongly urges elimination of the system and substitution of quoting on an f.o.b. mill basis. In concluding his 390-page brief, Mr. Steinhauer declares that "The limelight on the facts" (in the Pittsburgh-plus case) "is having its inevitable effect as it did in the case of, first, the pools; second, the price-fixing trade meetings; and third, the Gary dinners. All of these succumbed and we now hope for a speedy exit of Pittsburgh plus to the land of its predecessors." The brief of the Steel Corporation is to be filed on or before June 9, and arguments in the case will begin on June 23.

The brief, which contains numerous charts and maps, sketches the growth of the American iron and steel industry from its infancy, the various practices of the trade, including the old pools, and traces the evolution of the industry to the adoption of the Pittsburgh base. Taking up this practice, as he sees it, Attorney Steinhauer assails it as being in direct violation of Section 2 of the Clayton act, by reason of alleged price discriminations against consumers outside of the Pittsburgh district, and "substantially lessened competition"; and Section 5 of the Federal Trade act because of alleged unfair methods of competition.

Mr. Steinhauer elaborately reviews the testimony of many witnesses. Among them are Chairman E. H. Gary, and President James A. Farrell, of the United States Steel Corporation, the respondents, together with independent manufacturers, consumers and three college professors. The last named testified as economists.

Findings of Examiner Bennett

Mr. Steinhauer maintains that the findings of Examiner J. W. Bennett sustain every charge made in the complaint. Throughout the brief Mr. Steinhauer emphasizes alleged discriminating practices against Western industries by use of the Pittsburgh base. To typify this contention, Mr. Steinhauer quotes from the testimony of H. E. White, statistician of the commission, who, among other things, testified that the Pittsburgh plus adds 169 per cent more to the Chicago forging manufacturer's freight on his finished product from Chicago to Detroit. When selling at Rockford, Ill., Mr. White said, the actual freight on the finished product of the forging manufacturer from Chicago has increased 209 per cent because of the so-called fictitious freight which has been added to the cost of his steel.

When selling in St. Louis, it was testified his actual freight cost has increased 133 per cent, while at Indianapolis it increased 170 per cent. As freight rates determine the market, the brief declares, "so the additional or fictitious freight rates secured under the Pittsburgh plus system must tremendously increase that restriction."

Dealing with the alleged effects of the Pittsburgh plus system from the point of lessening competition of steel producers, the brief says:

"There is a vast amount of general testimony in the record relative to the uniformity produced by the Pittsburgh plus system, a considerable amount of which has just been set out. To support this testimony with specific figures required that the steel users produce their contracts, for the Corporation had alleged that their quoted prices were generally on a Pittsburgh base, but that the prices at which steel was sold was seldom the Pittsburgh plus price.

"Of the 3,709 contracts of all the different steel companies introduced in evidence by the commission, where the prices could be analyzed and compared with the Pittsburgh base quotations in THE IRON AGE for similar products, 3308, or 89.2 per cent used, a Pittsburgh base price which was absolutely uniform with THE IRON AGE quotations or within 5c. thereof. Of this number only 684 deviated to the extent of 5c. or less per 100 lb. The balance were uniform to the cent."

Quoted "The Iron Age"

Out of the 35 contracts of the Bethlehem Steel Co., furnished the commission for standard steel sold to competitors, of the witnesses who testified for the commission, 31 of these contracts use as a basis the identical Pittsburgh prices quoted in THE IRON AGE. Of all the contracts furnished the commission by the Lackawanna Steel Co., covering sales to competitors of witnesses, it is claimed, all but one contract used exactly the same Pittsburgh base price, not f.o.b. mill price, which was quoted in THE IRON AGE. At another point the brief says:

"Of the 3,700 contracts of the respondent, Illinois Steel Co., introduced in evidence by respondents, which cover products where the Pittsburgh base price which was used could be compared with the Pittsburgh base quotations in THE IRON AGE for similar products, 3,417, or 92.4 per cent, used a Pittsburgh base price which was absolutely uniform with THE IRON AGE quotations or within 5c. thereof; 71.8 per cent were absolutely uniform without one cent deviation. These uniform prices were not uniform to the Illinois Steel Co., but were uniform delivered prices."

A number of other comparisons between contract prices and the quotations in THE IRON AGE are made to show the similarity between the two.

The Birmingham Differential

In dealing with the history of the Birmingham, Ala., differential system, providing for a quotation of $5 per ton above the Pittsburgh base, it is charged by Mr. Steinhauer that this practice also is subject to the same condemnation as the Pittsburgh base practice is. It is contended that without maintenance by the Steel Corporation of the Pittsburgh plus practice and the Birmingham differential, the other producers of rolled steel in the United States would be unable to maintain them. The charge is further made "That the extra prices so extorted on all public work in the United States aggregate a very large sum which the public must pay through taxation, and that the extra prices likewise extorted from the consumers in the United States aggregate a very large sum which the general public must make." It is declared that neither of these practices has been adopted in good faith to meet competition.

In his arguments, Mr. Steinhauer concedes that the Pittsburgh plus system does not always work perfectly. In this connection, he says:

"As in periods of depression, the Pittsburgh plus system is beset with the same difficulties which hampered the pools, price-fixing trade meetings and Gary dinners, so in periods of boom business it encounters the same experiences. In times of booms, some of the smaller companies will refuse to sell the same kind of steel that the Corporation sells, namely, steel to be delivered at the convenience of the mill, but will sell steel only for immediate delivery because it commands a higher price. Steel producers do not object to this. If they do sell the same kind of steel as the Corporation does, however, the record is full of their admissions that they can get no more than the Corporation does for it. Their Pittsburgh plus prices are uniform. It is

(*Continued on page* 1619)

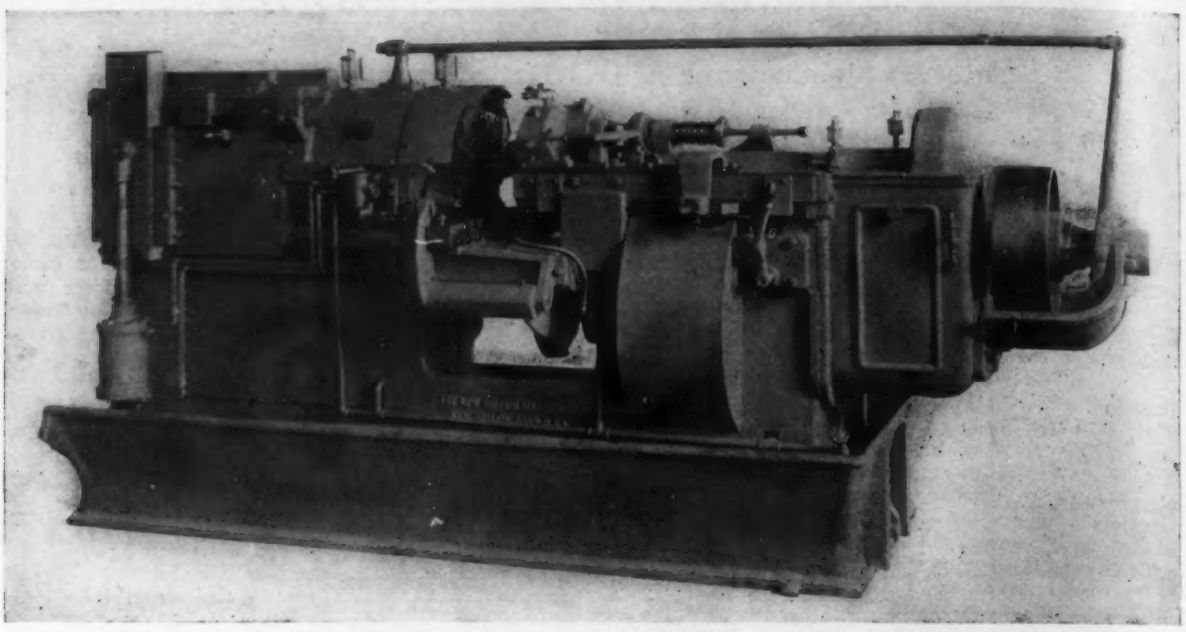


Fig. 1—Chucking Machine for Forgings and Castings On Which Facing and Forming Operations Are Required In Addition to Drilling and Reaming

AUTOMATIC CHUCKING MACHINE

Production Facilitated by Air Control for Stopping and Starting Spindles and Chucking and Unchucking Work

A new chucking machine called the New-Matic, which is of the station type and is intended for the machining of forgings and castings on which facing and forming operations are required in addition to drilling and reaming, has been placed on the market by the New Britain Machine Co., New Britain, Conn.

The machine is available in two sizes, weighing 10,500 lb. and 7500 lb., respectively, and each size may be equipped with either four or six work spindles. On the four-spindle machine there are four tool stations on the longitudinal tool-slide, one station on the front cross-slide and two stations on the rear cross-slide. The tools on the cross-slides may be used separately from those on the longitudinal slide or in conjunction with them, as in rocking a recessing tool mounted on the longitudinal slide into the work after the tool has been fed to depth.

The range of work attempted will naturally be on pieces which can be conveniently chucked horizontally or held in one hand while being chucked, and when the operations are subdivided to the extent permitted by multiple-spindle construction the production time on a job is so short that special means of quickly chucking the work becomes necessary. On small brass work the time of chucking might be as long or longer than the time of the actual machining operations. To provide for quick chucking or unchucking with stopping of the spindle, so that work of irregular contour may be grasped without danger to the operator, an air

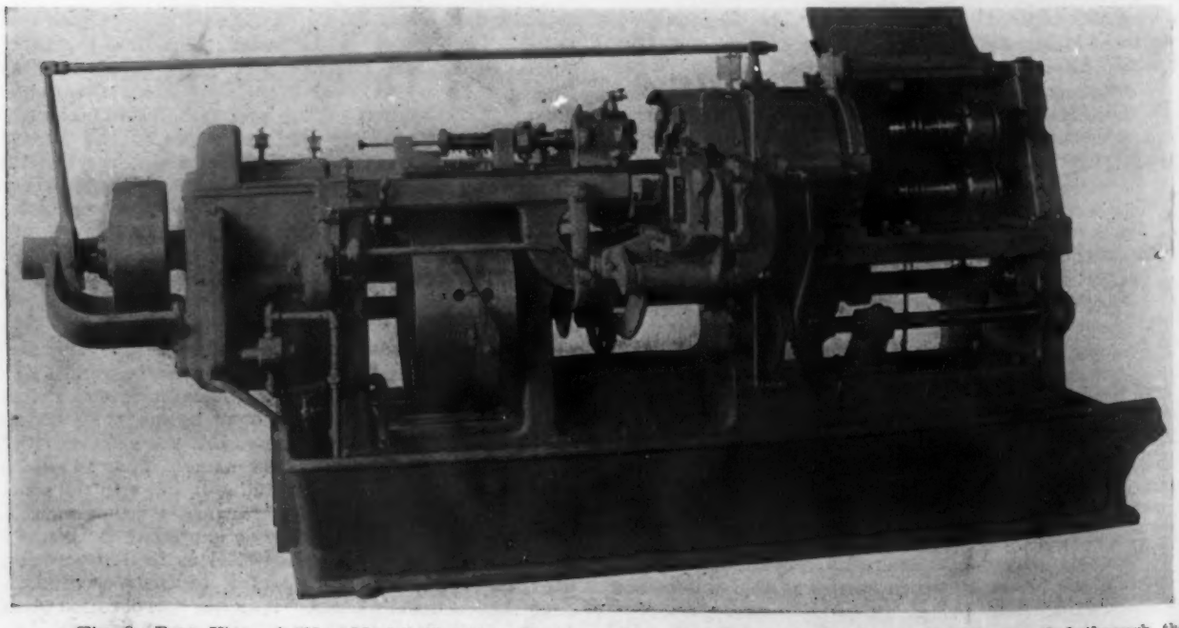


Fig. 2—Rear View of "New-Matic" Chucking Machine. The chuck is operated by a drawrod extended through the spindle to the chucking block

control has been employed and extended to cover the starting and stopping features.

Air Control One of the Principal Features

An outstanding feature is the air control, which is operated by a single air valve each time a work spindle is indexed into the loading position. It serves to disengage the drive to that particular spindle, applies a brake to quickly stop the spindle rotation and actuates a clutch mechanism to release the work. When the chuck has been reloaded the air valve is operated again to grip the jaws on the work, release the brake and engage the drive to the spindle. These operations, while taking place in sequence, follow a single movement of the air valve lever in one direction; with the movement of the lever in the opposite direction the sequence of operation is reversed.

Air chucking is intended to relieve the operator of the manual labor of hand chucking and much of the fatigue incident to it, and to permit of increased output. It is claimed that in the case of an installation of over 100 of these machines used in machining ball bearing cups and cones from alloy-steel ring forgings, it has been found that a production of over 90 per cent of the theoretical index time of the machine has been possible in a day's run. The combination of two machines has been found possible with a single operator, on productions running as high as 240 pieces per hour per machine unit.

In having an opportunity to stop and start the spindle at will while it is in the loading position, the operator may chuck a piece and determine by starting the spindle whether the work is rotating approximately true. If not, the rotation of the chuck can be stopped and the work reset without complications, as the control is not mechanically timed with any of the other functions of the machine. This feature is considered of great importance in assisting the operator to handle more than one machine with facility. Normally the operation of the machine continues if the operator keeps step with the fixed rate of production. In case he is delayed through repeated chucking or other abnormal circumstances beyond the normal index time of the machine, a safety device, also air controlled, comes into play. This prevents the indexing of the work to the next station until the feeding clutch is thrown in.

The machine may be equipped with either hand-operated chucks, collets or fixtures. In this case the air is retained for starting and stopping the spindle and actuating other features.

Wide Range of Spindle Speeds Provided

The method of gearing and the construction of the spindles and bearings permit a wide range of spindle speeds suitable for handling small brass parts or large forgings or castings, each at appropriate cutting speeds. Powerful drive for the collective group of tools and the means employed for reducing idle time between cuts are emphasized as features reducing production time.

Spur gear drive is used throughout on the spindles and feeds. An elliptical gear on the index train drives the Geneva motion to complete the index in a relatively small portion of the machine cycle and leave a large proportion of the circular cam drums for the actual work. The machine is driven by a single clutch pulley, but motor drive may be applied if desired.

From the pulley shaft the drive is through change gears to a long shaft through the center of the machine, on the end of which there is a gear engaging a group of clutch gears on the spindles. Location of the change gears permits changing spindle speeds without altering rates of feed and conversely, by the use of feed change gears, any desired rate of feed of cross slide or longitudinal slide may be obtained without affecting spindle speed. The feed train drive originates from the long shaft through the center of the machine and is modified by feed change gears in the gear box and controlled by clutch handle next to the large feed drum. Here the drive applies to a drum by large internal ring gear. By driving through the internal ring gear near the circumference of the drum directly under the tool slide cam drum the torque on the cam shaft is said to be greatly diminished. The pressure required to urge forward all the internal cutting tools is delivered through the circumference of the cam drum in a straight line to a hardened steel rocking cam shoe. The back thrust of the cam drum is received on a hardened steel thrust block attached to the frame running on the edge of the cam drum. The cam on this drum is universal and does not have to be changed for different strokes, but can be set for any stroke desired and then clamped to the drum by means of T-slots. Line and quarter marks on the drum are provided to facilitate setting the cam to uniform lead.

The cross slides are actuated by volute-shaped cams fastened on either slide and the cam disk, which is carried on the central cam shaft out of line of the chips falling from the tools working above. Further to the left on the cam shaft are the elliptical gears for driving the indexing and driving the locking bolt lever

Fig. 3—The Air Control Disengages the Drive to Spindle, Applies a Brake and Actuates Clutch Mechanism to Release the Work. When chuck has been reloaded these operations are in opposite sequence, being accomplished by single movements of the air lever, first in one direction and then in reverse

cam. The slotted disk of the Geneva motion is also mounted on the cam shaft and geared to a large ring on the periphery of the cylinder.

The cylinder casting is of one piece and is finished all over. In general form it consists of three drums with two connecting necks. The first drum section contains the forward bearings for the spindles; the middle drum section, the thrust bearings for the spindles and the locking bolt slots; the rear drum portion, the rear spindle bearings and also the index ring above noted.

The two-jaw external chuck for holding the work mounted on the spindle nose is shown in Fig. 3, and is operated by a draw rod extended through the spindle to the chucking block as shown in Fig. 2. A group of springs in this chucking block provides a yielding means which compensates for variations in the size of work. A check nut on the spindle serves to bring the thrust bearing into the adjusting position. Hand operation of the clutch or chuck may be obtained in any position while setting up the machine.

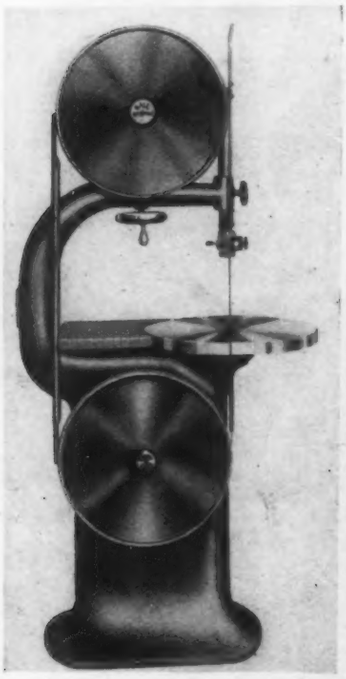
The main tool slide carrying the longitudinal acting tools is provided with an accelerating device, the same arrangement being used also to decelerate the feed of the tool.

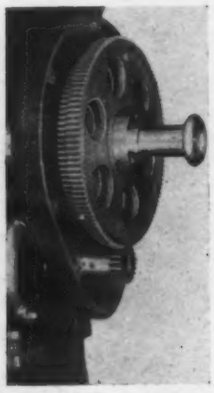
Two-Speed Arrangement for Band Saw

A two-speed arrangement for its 20-in. motor-driven band saw and intended to convert the machine into a dual type for cutting both wood and light metal, has been placed on the market by the Porter-Cable Machine Co., Syracuse, N. Y.

For wood, the speed of the saw is 3000 ft. per min. To change the speed for cutting metal a knob on the gear case is pulled out, this action serving to shift the gears and reduce the speed of the saw by half, or to 1500 ft. per min. The operation is said to be positive and without wear upon the gears.

The driving motor is housed in the base, is entirely inclosed and the driving mechanism runs in oil and is ball bearing mounted. The arrangement prevents the entrance of dust and grit to the mechanism, and there being no belts or exposed gears, danger to the operator from this source is obviated. The incorporation of the gear case makes little change in the appearance of the machine.





The Two-Speed Arrangement Permits of Cutting Both Wood and Light Metal. Pulling the knob on the gear case shown below reduces the speed of the saw

The two-speed arrangement is emphasized as extending the usefulness of the band saw for pattern shop work. It may be used for aluminum and brass cutting, sawing hard rubber and fiber in scroll designs and for other intricate cutting requiring accuracy. The device is not to be considered as an attachment as it is built into the machine, when the arrangement is specified.

Austria's Steel and Iron Output in 1923

The pig iron production of Austria in 1923 amounted to 344,096 tons, compared with 323,172 tons in 1922. The figures for steel were 499,442 tons in 1923, against 480,731 tons in 1922, and those of rolled material 364,930 tons in 1923, against 359,561 tons in 1922. During the closing months of 1923 there was a great increase in the output of finished material; but owing to the cessation of German orders, the production of rails declined heavily.

A portable arc welder has been developed by the General Electric Co. for use with metallic electrodes from 1/16 in. to ¼ in. in diameter. High voltage may be used for complete penetration on heavy work and low voltage to prevent burning through on light work. The assembled unit is about 63 in. long, 29 in. wide and 47 in. high, weighing about 1600 lb.

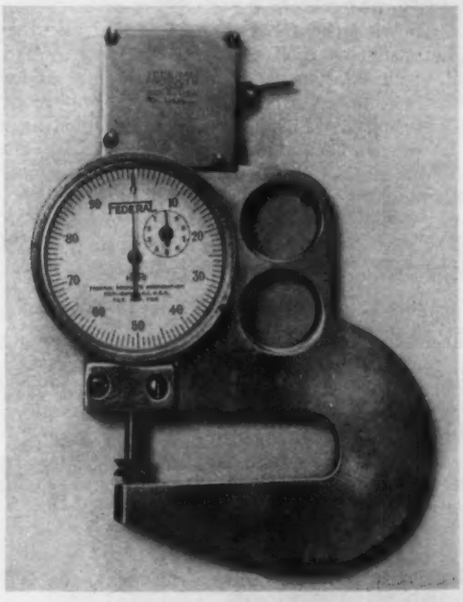
Sillimanite for Super-Refractories

An investigation having for its purpose the production, by electric furnace methods, of materials of higher refractoriness than those commonly used in commercial practice is being conducted by Seattle, Wash., experiment station of the Bureau of Mines. Such refractories have been called super-refractories. The first material to be investigated is sillimanite. Two methods of preparing the material are being studied: From a mixture of clay and aluminum oxide in the form of bauxite, diaspore, or alunite residue; or from clay alone by removing the requisite amount of silica and the iron by melting with carbon in the electric furnace. The material thus produced in the electric furnace is then subjected to the methods of testing refractory materials and is fashioned into brick and other shapes and given both refractory and commercial tests. Encouraging progress has been made in this investigation. It is expected that the work on sillimanite will be completed during the present fiscal year and that another material will be taken up.

Dial Thickness Gage for Sheet Metal

A light-weight dial thickness gage, designated as model No. 22, and intended for convenient measuring of sheet metal, battery-separators, leather and other flat material, has been added to the line of the Federal Products Corporation, Providence, R. I.

The arrangement of anvils, throats and other parts may be noted from the accompanying illustration of the gage. The body is of aluminum. The anvils are hardened and ground and may be either flat or ball pointed as desired. The gage may be provided with the company's models C, D, E or F indicators. The spindle has a range of 0.500 in. and is raised by pressing down the small lever shown at the top. The tension spring may be altered to suit various needs. The depth of the throat is 2 in.



Dial Gage for Sheet Metal and Other Flat Material

A similar gage with a spindle range of 0.100 in. and designed to be carried in one's vest pocket, was described in THE IRON AGE of Nov. 22, 1923.

The Safety Department of the Youngstown Sheet & Tube Co., Youngstown, has issued an appeal to employees to aid in reducing the number of accidents within the plants. The department points out that because safety has been lost sight of to some extent, the safety record during the first three months this year at the Youngstown district properties was unsatisfactory. The company is revising its rule book.

Heavy Caster for Industrial Trucks

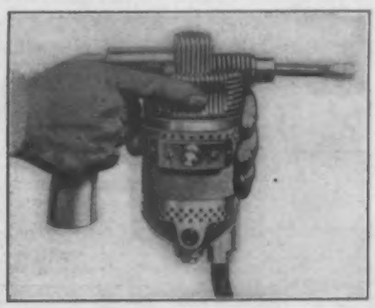
An all-steel ball-bearing heavy duty caster for use on industrial trucks or other equipment requiring casters that will stand hard service has been brought out by the Colson Co., Elyria, Ohio. The wheel is of die forged steel and has a machine-turned hub and tread. The cups and cones of the bearings are machined and hardened. The axle is of combination tubular and solid type.

The caster swivels on a ball bearing head and is provided with two sets of bearings. A large ball race carries the load, the balls riding between two ⅝-in. plates, a top and base plate. The balls in the smaller race that assist the larger ball race in carrying the load are located between the base plate and a steel cone. The cone is so fitted into the top plate that both ball races are held in alinement. Machined grooves provide races for both sets of balls. The space between the plates is filled with grease which is held in place by a felt retaining washer. The side plates are riveted to the base plate at the top and braced at the lower end by a double axle. All the bearings are lubricated by the Alemite system.

The caster is made in both the swivel and stationary types in two sizes with 5 and 8 in. wheel diameters, 2½ in. width of tread, 7¼ and 10⅜ in. total height and weighing 19 to 34 lb.

Portable Electric Screw Drivers

A portable electric screw driver and an automatic lag screw driver, a feature of which is an automatic overload safety device which shuts off the current when the motor runs beyond its rated capacity, preventing damage to the motor, have been placed on the market by the John Steptoe Co., Cincinnati. These tools are part of the line formerly built by the Automatic Electrical Co., Cincinnati, the manufacturing and selling rights of which line the Steptoe company has recently acquired.



The electric screw driver weighs only 5 lb. and may be held in one hand while driving screws in or out, the other hand being free to hold the work in position. It is claimed that No. 16 screws 3 in. long may be driven into hard yellow pine without first drilling a hole. By placing a bit on both sides the tool may be used for driving or withdrawing screws. Right- and left-hand spindles are provided. They run at 250 r.p.m., and are arranged so that they will not revolve until the bit is placed in the screw slot and downward pressure applied to engage the positive driving clutch. Although the aluminum pistol grip is provided as regular equipment, it may be conveniently removed if desired.

The motor, which is of special design, runs at 10,000 r.p.m., and is reduced to the spindle speed through a gear and worm drive. The motor is air cooled by a fan, which is machined from a heavy bronze casting. Ball bearings are employed for the armature and gear shafts. The casing is of aluminum. The automatic overload safety device is regular equipment. The conductor cord is reinforced at the machine end with heavy rubber hose and is attached to a terminal block, to prevent strain on the motor by pull on the cord.

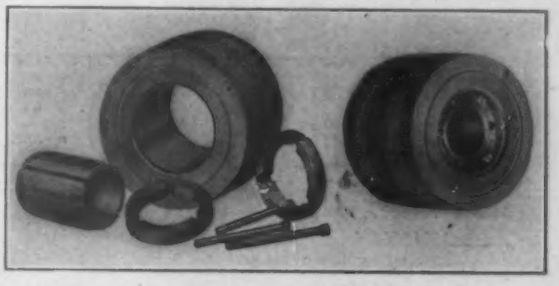
The machine is rated to drive any size screw that can be driven by a hand brace. The automatic lag screw driver may be used to advantage in putting up countershafts and in lagging machines to platforms. This machine weighs 30 lb.

Iron-Center Wood-Rim Motor Pulley

A new iron-center wood-rim motor pulley recently added to the line of the Dodge Mfg. Corporation, Mishawaka, Ind., is shown in the accompanying illustration.

The pulley is made up of two principal parts, as shown, the slit iron hub and the wood rim. The hub comprises a slit bushing, two wedge rings and three or more fillister head machine screws, according to the size of the hub.

The wood rim is made of select stock, laid up in segments and glued under heavy pressure. A seamless steel tube, which is forced into the wood rim and securely interlocked, supports the rim and drives it through frictional contact with the wedge rings on the slit iron bushing. The slit bushing is provided with a tapering surface at both ends. When the screws are tightened the wedge rings, which are also tapered, are brought together and become wedged between the steel tube in the rim and the slit bushing. The bushing is thus contracted on and held to the shaft by the wedge



action of the rings. The steel tubing is claimed to provide substantial backing for the wedge rings.

Ease of applying the pulley is a feature emphasized and by tightening the screws, gradually and uniformly, the pulley may be securely fastened. Removal is also easily accomplished and a screw driver is the only tool required for both installation and removal.

Study of Quenching Media for Heat Treatment

In connection with the investigation which the Bureau of Standards is conducting on the effect of various quenching media used for the heat treatment of steel, 90 cooling curves were taken during the past month on steels varying from 0.25 to 1.25 per cent carbon with the object of studying the critical cooling rate to effect hardening. The apparatus used records the presence or absence of the normal, the lowered, and the "split" transformations on cooling at the cooling rates obtained in quenching. Even at cooling rates in the neighborhood of 335 deg. C. or 600 deg. Fahr. per sec., the apparatus records these transformations. Some of the results are at first sight anomalous, and hardly in accord with the usual conception of what occurs during quenching. They appear, however, to be generally consistent with the super-cooling or "delayed crystallization" explanation given by Hallimond from the standpoint of physical chemistry. It is believed that this work will point out that the hardness of steel by quenching follows the laws of physical chemistry and is not such a mysterious matter as is usually supposed. Many hardness tests and microscopic examinations will be required to round out this work.

In connection with its study of mine column failures the Bureau of Mines has requested the Bureau of Standards to carry out an investigation to determine the compressive strength of iron ore under vibration. Apparatus has been designed for these tests and it is hoped that as a result of the work some information of value may be obtained.

STRUCTURAL STEEL IN APRIL

First Four Months 13 Per Cent Under Corresponding Period of 1923

WASHINGTON, May 26.—The Department of Commerce announces sales of fabricated structural steel for April, based on figures received from the principal fabricators as 65 per cent of capacity, with total sales of 151,156 tons reported by firms with a capacity of 232,295 tons per month. Shipments of firms reporting this item represented 72 per cent of capacity as against 65 per cent in March, 60 per cent in February and 64 per cent in January.

The table below lists the statistics reported by 184 identical firms (including data in earlier months for seven firms out of business), with a present capacity of 240,945 tons per month, comparing with 244,345 in 1923 and 237,415 in 1922. For comparative purposes the percentage figures are prorated to obtain an estimated total for the United States, based on a capacity of 250,00 tons per month for 1922 and 260,000 tons per month in 1923 and 1924.

1923	Actual Tonnage	Per Cent of Capacity	Computed Tonnage
January	177,346	73	189,800
February	190,262	78	202,800
March	227,114	93	241,800
April	191,742	78	202,800
May	138,576	57	148,200
June	123,351	50	130,000
July	123,266	50	130,000
August	140,768	58	150,800
September	127,612	52	135,200
October	118,989	49	127,400
November	130,218	54	140,400
December	192,762	80	208,000
1924			
January	170,354	71	184,600
February	[1] 175,813	73	189,800
March	[2] 168,144	70	182,000
April	[3] 151,156	65	169,000

[1] Reported by 181 firms with a capacity of 240,045 tons.
[2] Reported by 179 firms with a capacity of 239,495 tons.
[3] Reported by 164 firms with a capacity of 232,295 tons.

Refractories Business Still Dropping

Downward slant of refractories business continued in April, according to the monthly report of the Refractories Manufacturers Association, just issued. Shipments of clay fire brick gained slightly in April as compared with March, but this is probably due to the fact that more capacity is embraced in the April report than that for the month before. Net new business was off close to 900,000 equivalent 9-in. brick as compared with March. Silica brick shipments in April fell 1,278,652 equivalent 9-in. brick as compared with March and there was approximately the same decrease in net new business. Free stocks of clay fire brick at the end of April were equivalent to about two months' requirements at the April rate of shipments and there were enough silica brick piled up at manufacturing plants to accommodate requirements for more than a month at the April shipment rate.

Figures for April and March in 9-in. equivalents, figures in parentheses being the percentage to monthly economical producing capacity of those reporting, follow:

	April	March
Clay Fire Brick		
Capacity reporting	52,632,300	51,132,300
Stock first of month	141,345,102(267)	133,526,240(260)
Production	41,966,199(79)	42,776,856(83)
Shipments	38,282,634(72)	38,111,554(74)
Stock end of month	145,028,667(274)	138,191,542(269)
New business	38,308,366(72)	38,931,427(76)
Cancellations	767,891(1)	492,577(1)
Net new business	37,540,475(71)	38,438,850(75)
Unfilled orders	54,365,887(103)	50,632,764(99)
Silica Brick		
Capacity reporting	8,019,677	8,019,667
Stock first of month	12,950,174(161)	12,809,951(159)
Production	5,045,843(63)	6,604,985(82)
Shipments	5,186,110(64)	6,464,762(80)
Stock end of month	12,809,907(159)	12,950,174(161)
New business	4,122,765(51)	6,053,185(75)
Cancellations	7,900(0)	666,706(8)
Net new business	4,114,865(51)	5,386,479(67)
Unfilled orders	8,717,420(108)	9,788,665(121)

The stock on hand includes large quantities of shapes made up in advance of the receipt of the actual orders and as they could not be made to apply on new orders are not to be considered as "free stocks." The actual "free" stock of 9-in. straights at the end of April compares with that at the end of March as follows:

	April	March
Clay fire brick	67,805,009	70,222,588
Silica brick	6,094,237	7,101,122

Iron Ore Claims Sold

A mining deal said to involve approximately $1,500,000, by which 75 iron ore claims at Goudeau in the Sault Ste. Marie, Ont., district, have been turned over to a large New York syndicate by Harry Dreany of Toronto, Ont., and associates of Toronto and North Bay, who staked and recorded the claims during the past six years, has just been reported. Harry Dreany has been employed by the American capitalists to supervise operations at Goudeau during the present season and has already employed a gang of men to commence building new camps and fit out the old ones, for the purpose of beginning operations immediately. Considerable time will be spent in diamond drilling.

New Homestead Structural Mills Are to Be Electrically Driven

The new structural mills which the Carnegie Steel Co., is building at its Homestead, Pa., works are to be electrically driven. Present units are steam driven. The company is replacing three old structural mills at this plant with two of modern design and greatly increased capacity. The Westinghouse Electric & Mfg. Co. will furnish the electrical equipment for one of the two new mills, the order having recently been placed. It involves more than $1,000,000 and includes: one 15,000-kw. turbo-generator; one 44-in. reversing blooming mill equipment, consisting of one 15,000-hp. flywheel motor generator set and a 5000-hp. A. C. motor; one 36-in. reversing intermediate mill equipment, consisting of one 10,000-hp. reversing motor and a flywheel motor generator set, with a 3750-hp. driving motor; a 28-32-in. three-stand finishing mill, with a 6000-hp. direct connected continuous running A. C. motor, a 125,000 lb. flywheel and auxiliary equipment. Each mill unit driving equipment also has auxiliary equipment, such as switchboards, control, etc. The large turbo-generator will be installed in the power house of the Carrie furnaces, across the Monongahela River from Munhall, where the new structural mill is being erected. The power unit will be added to generators already installed in order to supply current to the new electrification equipment. The current will be carried across the river on an overhead system containing aluminum cables to a sub-station in the mill.

Iron Workers' Strike in New York Wanes

Of the 1200 union structural workers who went on strike May 1 in New York, about 500 were at work last week and so far as employers are concerned the strike has been broken, according to a statement from Executive Secretary R. B. Thomas of the Iron League of New York. While admitting that jobs are proceeding with undermanned crews, Mr. Thomas said that 60 per cent of the building suspended May 1 by the International Association of Bridge, Structural and Iron Workers has been resumed. Strike demands were for a $12 day and a closed shop. Hundreds of workers have come from centers where help is plentiful. About 30 came last Saturday from Pittsburgh, Cleveland and Detroit. Contrary to reports, the Iron League has not been dealing with union representatives, Mr. Thomas said.

Diesel Engines for Freighters

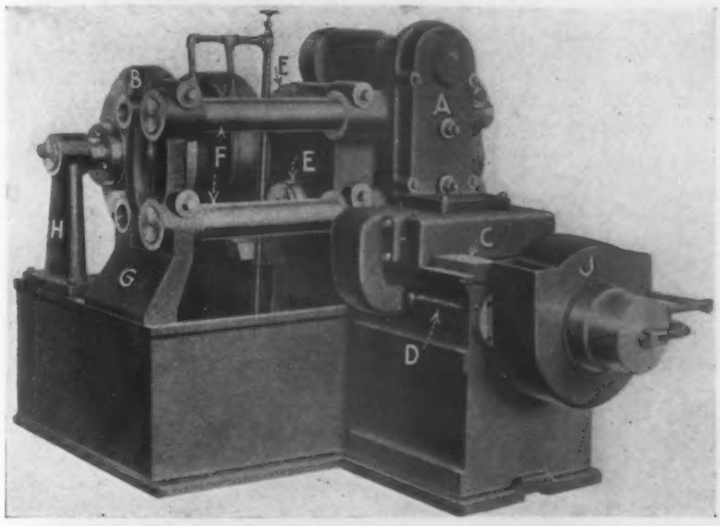
WASHINGTON, May 27.—The Senate last Friday approved an amendment to the shipping act authorizing the Shipping Board to spend $25,000,000 to be used in equipping Government freighters with Diesel engines, which it is proposed to sell subsequently to private interests. The amendment previously was adopted by the House.

NEW HIGH-PRODUCTION MILLER

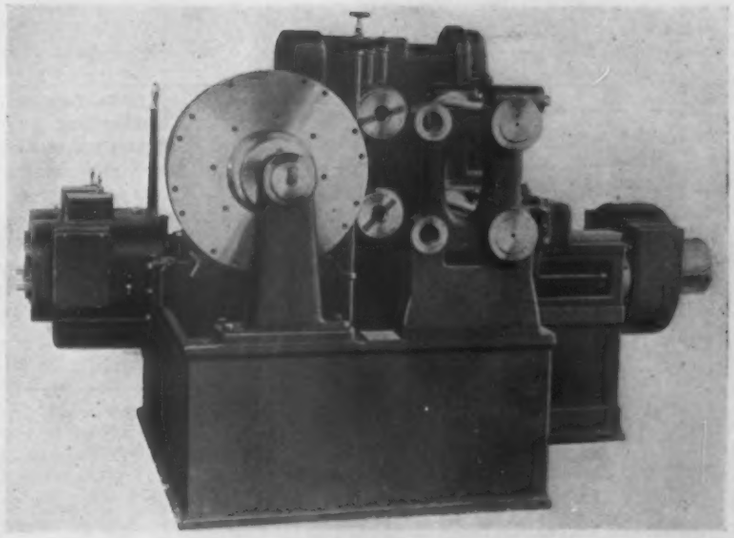
Double-Spindle Machine for Continuous, Station-to-Station, or Gash Milling

A double-spindle milling machine incorporating distinctive features and intended for the high production of a variety of work has been brought out by the Rockford Milling Machine Co., Rockford, Ill.

The machine, which is known as the Sundstrand continuous double-spindle production miller, comprises a work holding turret on a horizontal shaft and a sliding spindle head, both of which are mounted on the base, as shown in the accompanying illustrations. Various combinations of movements are secured by simple adjustment of dogs on a feed drum. For continuous milling, the turret may be set to revolve and the spindle head to remain stationary, or if desired, with the spindle head stationary, the turret may be made to rotate one piece being milled and then the turret indexed to bring the next piece to the cutters.



Double-Spindle Production Milling Machine, Which With Its Various Combinations of Movements Secured by Simple Adjustment of Dogs on a Feed Drum, Is Versatile. It may be used for continuous, station-to station or gash milling



For gash milling the turret may be indexed and held stationary while the spindle head feeds in automatically and the cutters perform the operation, after which the cutters back out and the turret indexes to the next position. The turret may be indexed four or eight times to the revolution of the drum. It is claimed that for gash milling this procedure is faster and better than feeding the work through the cutter.

The incorporation of two spindles is a feature emphasized as eliminating two set ups in taking roughing and finishing cuts. The upper spindle carries the roughing cutters and the lower the finishing cutters. For mass production, both the upper and lower spindles may be used for roughing, this being arranged for by a simple adjustment of the dogs on the feed drum, the turret indexing two stations at a time.

Ease of loading and unloading the work has been provided for in having the revolving turret which carries the work and all control levers in the most convenient position. The cutters are arranged to face the turret, and the spray of coolant is directed downward over the cutters and work, which serves also to wash the chips from the fixture.

The base of the machine is a one-piece casting, well ribbed and with wide bearing surfaces for the spindle head and turret drive mechanisms. An accessible compartment for chips and a reservoir for cutting coolant is provided directly below the turret.

The spindle head, shown at *A*, is mounted on the base at the rear of the turret *B*. It is provided with wide long bearings and a dovetailed way, *C*, fitted with a taper gib, a construction intended to eliminate any tendency toward twisting. The spindle head is moved forward and backward by a large diameter feed screw, *D*, supported in the center of the dovetailed way or guide, and provided with a long take-up nut. The maximum travel of the spindle head is 10 in.

The spindles *EE* are mounted in large phosphor-bronze bearings which are adjustable for wear. The upper spindle is driven through a large worm gear and worm which is hardened and ground and is mounted in roller bearings. Change gears provide for 11 changes of speed from 17 to 156 r.p.m. The lower spindle is the one most frequently used for finishing cutters. Change gears are provided on the rear side of the spindle head to give a wide range of speeds. For roughing on mass production the upper and lower spindles may be arranged to run at the same speeds.

The spindle drive mechanism runs in a bath of oil and the shafts, which are hardened and ground, are mounted in roller bearings. The main drive consists of a long, horizontal gear connected to a driving gear in the spindle head. The outboard support provided for the cutter arbors is shown at *G*, and the two rods for attaching it to the head are shown at *F*. The support rests on a machined pad on the base and is free to slide with the head. The cut being upward the tendency is for the cutters to bear down, and it is claimed that with this support chatter and vibration are eliminated.

The turret is mounted on a heavy shaft, which remains stationary. This shaft is supported at one end in the turret housing, which is mounted on the bed in a dovetailed way. The other end of the turret shaft is supported by the outboard bearing, *H*. The turret housing has an adjustment of 4 in. parallel with the spindle, which is convenient when setting up different jobs and in alining the cutters with the work.

Revolving the turret on a stationary shaft is said to reduce the tendency to chatter. Another feature claimed for the stationary shaft is that the drum may be changed without the necessity of replacing a shaft with the drive mechanism for each different job. Different types of turrets, round, square, hexagon or oc-

tagon, may be used. Each turret is designed for the work for which it is required. The turret has a gear of large diameter and wide face which meshes with a pinion on a worm-driven shaft. The gears in the turret are guarded from dirt and grit.

The automatic feed control for the turret and spindle head is of simple construction and is accessibly mounted. Several different combinations may be obtained by the adjustment of two graduated revolving drums. The turret is controlled from the left-hand drum, the right-hand drum controlling the feed of the spindle head. There are seven feed changes ranging from 1.4 to 9.7 in. per min.

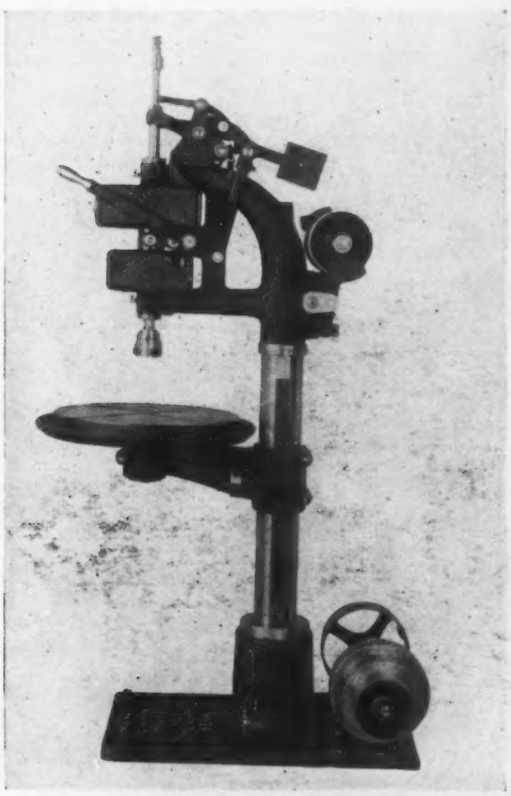
The machine may be arranged for either belt or motor drive, a 7½ to 10-hp., 1200-r.p.m. motor being recommended. The size of the driving pulley is 16 x 5 in. Each spindle has a No. 11 B & S taper hole, and the hole through the spindle is 63/64 in. The distance between centers of spindles is 12 in., and the distance between the face of the spindle and the arbor support is 20 in. The rapid return of the spindle head is 155 in. per min. The rapid index of the turret is 2 r.p.m. The maximum swing of the turret is 38 in. and the distance from floor to center of turret is 36 in.

The floor space occupied by the machine is 65½ in. x 97¼ in., and the net weight approximately 8360 lb.

Improves Automatic Tapping Machine

The Garvin Machine Co., Spring and Varick Streets, New York, has placed on the market the automatic tapping machine illustrated, which is designated as the No. 2-X and improved features of which include the application of Timken roller bearings.

Operation is controlled by a slight downward pull of the hand lever and beyond this the machine is entirely automatic. The spindle is fitted with two friction pulleys driven in opposite directions by one continuous belt. Between the pulleys there is a double-faced friction clutch, which is connected with the starting hand lever by a toggle mechanism, the latter being adjustable to any tension for different jobs.



Automatic Tapper Having Capacity of 1 In. in Cast Iron. The application of Timken roller bearings is an improved feature and changes have been made in the mounting of the spindle driving pulleys

In the machine previously offered the upper spindle-driving pulley had an extended hub which assembled into the head and which revolved with the pulley. The hub formed the support for the pulley and also provided the bearing for the spindle. Thus both the spindle and spindle bearing revolved, and it was found that a tight belt could cause a cocked position or cause excessive wear on the spindle box.

In the new machine the extended hub on the pulley has been eliminated and the pulley has been mounted on roller bearings, which take the radial and thrust loads. These bearings are mounted on a stationary bronze spindle sleeve so that the pull is in a direct line with the center of the bearing, and is not transmitted to the spindle. This construction is emphasized as providing additional support for the pulleys, eliminating the possibility of "cocking," and at the same time permits the long, stationary bronze sleeve to become the bearing for the spindle. It permits the transmission of all the power available for actual work, and a double belt may be employed, if desired, for heavy work.

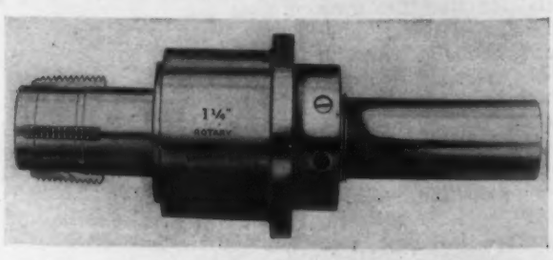
Table improvements include deep oil channels, large drains into oil reservoirs. The table retains the features of the previous design. Motor drive may be conveniently applied by removing the back shaft stand from its planed surface and bolting in its place a motor plate. The motor and a roller bearing, spur gear speed reducer is then mounted on the motor plate. No shimming or blocking is required. The speed reducer is designed to transmit any power that can be put through the belt. The gears run in oil.

The No. 2-X machine has a capacity of 1 in. in cast iron. A No. 1 automatic machine having a capacity of ½ in. standard tap in cast iron is also available. The machines are available also in units of two and three heads or in combinations incorporating the No. 1 and the No. 2-X heads. The machine illustrated will tap to a depth of 2½ in. The distance from the center of spindle to the column is 12½ in. The spindle is 1 5/16 in. in diameter and has 3½ in. movement. The vertical adjustment of the table is 18 in. The floor space required is 31 x 45 in. and the shipping weight, crated, is 1035 lb.

Adjustable Collapsing Rotary Tap

The adjustable collapsing rotary tap shown in the accompanying illustration for use on hand and automatic drilling machines and multiple spindle automatics, is a recent addition to the line of the Geometric Tool Co., New Haven, Conn.

The tap is provided with a flange trip, and the chasers are expanded without slowing down or stopping the spindle of the machine. Simplicity and compactness are features, the tap being made up of only five units. All parts subjected to wear are hardened. Adjustments are made conveniently and the chasers may be removed by taking off the cap on the front of the tap. The flange trip is operated by coming in contact with the closing forks, or collar, attached to the machine. The opening and closing of the tap is controlled by the flange. Where it is desired to have the tripping of the tap controlled by the work, the tap is provided with a plate trip.



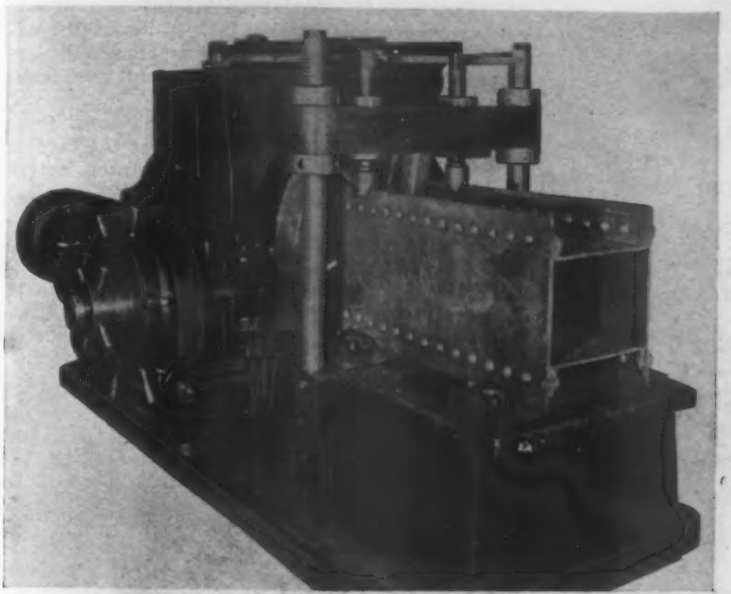
The Chasers Are Expanded Without Slowing Down the Spindle

Column Facing Machine for Bridge and Structural Shops

New equipment of special interest perhaps to bridge and structural shops is the heavy-duty column facing machine shown in the accompanying illustration.

The machine, built recently for a large fabricating company by the Newton Machine Tool Works of the Consolidated Machine Tool Corporation, Twenty-third and Vine Streets, Philadelphia, is intended for the rapid and accurate facing of the ends of columns, girders and beams. It has capacity for I-beam sections up to 27 in. and H-columns up to 22 in.

The cutter head is a steel casting, 31½ in. in diameter over the cutting tools, which are fitted in accurately machined radial slots and held by wedge-shaped clamps. The spindle is a carbon steel, hammered forging, hardened and finished ground, and is 8 in. in diameter in the bearings, the nose being 18 in. in diameter. It is fitted in scraped bronze-bushed bearings which are capped to provide compensation for wear.



Machine for the Accurate Facing of Ends of Columns, Girders and Beams. The capacity is for I-beam sections up to 27 in. and H-columns up to 22 in.

The spindle has feed traverse of 2 in., and the feeds are transmitted to the spindle through a stationary screw and revolving nut, the essential gears in the train that drives the nut being of steel. Power rapid return to the spindle is also provided through a friction clutch. Both the feed and power return are automatically disengaged at either end of the spindle traverse to prevent possible damage to the machine. Both the feed and power return are controlled by the same lever on the side of the machine, the power feed friction clutch being released by a fly nut. The spindle has hand adjustment by means of large pilot wheel.

The table and base are one-piece casting, of heavy box section with oil and chip pans integral on both sides.

The machine may be arranged for belt drive or belt-connected motor drive. The motor is mounted on a shelf which is a box-type casting bolted to the top of the machine, forming a cover over the driving worm. It is fitted with adjustable motor rails. A 20 hp. 1200-r.p.m. constant-speed motor is recommended, although, when variations in the hardness of materials to be machined necessitates variations in speeds, a 600- to 1200-r.p.m. variable-speed motor may be employed.

The machine is equipped with pump, piping and attachments for cutter lubricant, cutter head and all necessary wrenches, and with either a screw type yoke clamp, as shown in the illustration, or with a special type of air clamp with necessary holding blocks. It is claimed that on the class of work for which it is designed, the machine will do more work than a rotary planer.

Double Drive for Reversing Mill

Tests made by Pease & Partners, Skinningrove, England, in driving a two-high reversing mill with two motors, in place of using one motor with pinions between the rolls, are described in a recent issue of *Iron and Coal Trades Review*. The test was made on a 3-stand blooming mill driven ordinarily by a double-armature reversing motor with a peak of approximately 12,000 hp. This blooming mill is associated with finishing mills driven by another reversing motor running up to a peak of 19,000 hp.

For the purpose of the test the bottom rolls were all driven from the 19,000-hp. motor and the top rolls from the 12,000-hp. motor, with the pinions in both cases running idle. Both motors were controlled from one station. It was found possible to operate the mill so well that it gave no indication that the pinions were not in engagement. The section rolled in the test was a flat of 18 x ¾ in.

It is said that the new method, aside from reducing the cost of installation by omitting pinions, will in operation avoid all pinion troubles and permit automatic setting of the rolls to a speed corresponding to requirements, thus overcoming the difficulties encountered when one roll has been dressed to a diameter slightly less than the other. With the double drive the peripheral speeds of the rolls automatically accommodate themselves to the surface speed of the work, reducing the power required for rolling and giving a better surface to the plate, owing to the avoidance of slipping. Interesting possibilities also are introduced of variation of torque at the surface of either roll, to counteract any tendency there might be toward bending of the plate in passing through.

An interesting confirmation of the claim made that the speed of the rolls is self-adjusting happened to occur during the course of the tests. Owing to a slightly incorrect setting of the rolls, the bar in the edging pass with the mill operating normally took a distinct bend. In spite of the fact that no alteration was made to the setting of the rolls, the new form of drive produced a perfectly straight bar in the edging pass.

Mined Limestone Is Purer Product

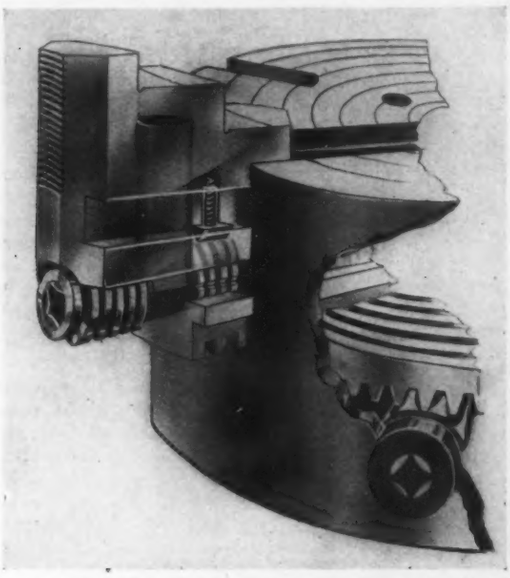
The purity of the limestone product obtained in mines as compared with that produced in many open pit workings has a very important bearing on use, states Oliver Bowles, superintendent, non-metallic minerals station, Bureau of Mines, Department of the Interior, in Serial 2585, recently published.. Many limestone plant operators supply stone to the fluxing market where there is a strong objection to the presence of fines. The open hearth operator's objection is chiefly on the basis of impurity, for any siliceous material such as clay or sand associated with the rock is segregated with the fines. For blast furnace flux, draft retardation is one objection to fines, but impurity of the fines is also an important basis for rejection. Thus objection to the smaller sizes is due not so much to the inability of the furnace men to use fines as to the fact that through many years of experience furnace men have found that fine materials almost invariably contain an excess of silica. Where the operation is conducted underground, and no clay seams or pockets are encountered, the fines are as pure as the lump stone. When flux stone users are convinced of this fact it is probable that a much wider market will be found for the smaller sizes of stone produced in mines.

Research Group News is the title of a new monthly pamphlet issued by the Electric Steel Founders' Research Group. Its first issue, April, has 7 pages.

Lathe Chucks Having Universal and Independent Action

The Cushman Chuck Co., Hartford, is placing on the market a new chuck called the Tri-Plex, which is claimed to be the only chuck having both universal and independent movements of the jaws that indicates automatically when the jaws have found a common center.

The jaw construction may be noted from the accompanying illustration. At the base of each jaw there is a hardened chrome-nickel screw, and hard steel thrust bearings seated in the jaws encircle each screw. The screws engage into steel racks beneath



Provision for Rapid and Convenient Change From Eccentric to Concentric Chucks Is a Feature

them, the lower surfaces of the racks meshing into a scroll. When the scroll is revolved by the pinion gear all the racks are carried concentrically forward or back.

The pitch of a screw carries the jaw on its rack exactly 1/5 in. in a full revolution. There is a narrow, V-shaped groove on each screw and in each jaw there is an index pin. As the screw is turned the index pin rides over it until it engages the groove. The pin clicks into place after a full turn of the wrench, the operator knowing thereby that the jaw has moved an exact distance, 0.200 in. The index pin is said to ride in and out of the groove without forming more than a slightly noticeable obstruction.

To change a chuck from concentric to eccentric action, the screw of the jaw to be adjusted is turned with the wrench. In making the chuck concentric, each screw the jaw of which has been given an eccentric position is turned until the index pin clicks into the slot in the screw, it being observed at the same time that the ends of all jaws are approximately in the same relation to the same circular observation line on the face of the chuck body. It is claimed that the chuck will then be concentrically true within 0.005 in. and that testing is unnecessary.

The body of the chuck is of gray iron, of one piece and formed like a truss. The jaws are of steel and in connection with the individual racks are reversible. All surfaces are hard and being ground to standard gages are interchangeable. The screws are of chrome-nickel steel, hardened. The thrust bearings are self-alining and of improved design. The scrolls are of steel and the pinion gears of alloy steel and heat treated.

Four sizes, 9, 10½, 12 and 15 in. respectively, are available.

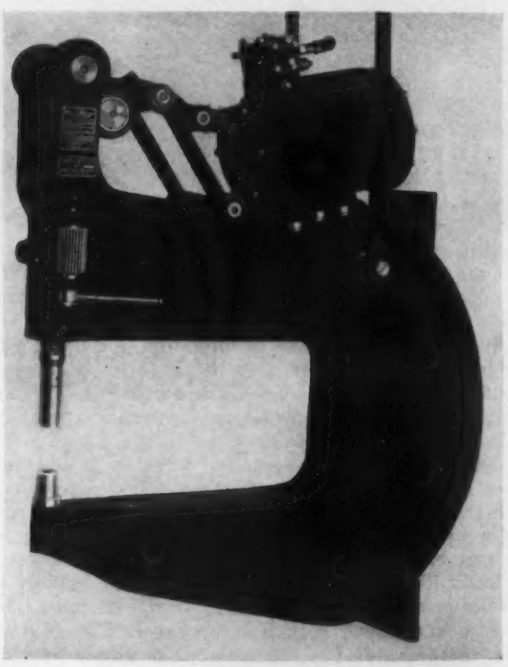
The railroads on May 7 had 324,779 surplus freight cars in good repair. This was a decrease of 4710 under the number reported on April 30, at which time there were 329,489.

Die Screw Adjusting Device for Pneumatic Riveter

An accessory for use with the Hanna type pneumatic riveter and intended to permit employment of the machine on work of varied plate thickness with a minimum of time lost in adjusting the dies at each new grip has been brought out by the Hanna Engineering Works, 1765 Elston Avenue, Chicago.

With ordinary variations in thickness in plates it is unnecessary to readjust the die screw, this being provided for in the machine by means of a mechanism, previously described, that develops a predetermined pressure uniformly throughout the last half of the piston stroke. The new die screw adjusting device is for use where there are large variations in the thickness of plates, in which use it is claimed to save time and labor. A few pulls on the ratchet handle advances the die screw rapidly, obviating interruption of the continuous operation of the riveter. Without the adjusting device the die screw adjustment must be accomplished with a pair of tongs, the screw itself usually being too hot to turn by hand.

The arrangement of the device may be noted from the accompanying illustration. Rotation of the ratchet handle causes the large ratchet gear to rotate. Motion is transferred through an idler gear to the vertical gear, which is attached rigidly to a vertical gear shaft. This shaft is fastened by a pin to the upper end of the die screw, which it rotates. The vertical gear, the idler, the plunger, and the die screw form a single unit, which reciprocates with the Hanna mechanism. The ratchet gear is long enough to permit the idler to



Die Screw Adjusting Device for Use Where There Are Large Variations In Thickness of Plates to be Riveted

slide on it for the full stroke and remain in mesh at all times.

This mechanism is an addition to the ordinary standard riveting machine, and is recommended for use where the regular run of work involves several large variations in thickness of grip.

Cincinnati Chapter, American Society for Steel Treating, elected the following officers at the annual meeting held May 8: Chairman, J. Culver Hartzell; vice-chairman, E. P. Stenger; secretary-treasurer, F. L. Martin; executive committee, R. T. Hazelton, W. Kinsey, G. A. Muenzemaier, J. H. Nead and C. H. Waldo. W. R Fleming, Andrews Steel Co, addressed the meeting on heat treatment of steel. W. H. Eisenman, national secretary, outlined the plans for the national convention and exhibition at Boston in September.

Machine Tool Makers Discuss Many Topics

Budget Control—Simplified Cost Finding—Automobile Market—New Manufacturing Plan—Dealer Relations —Dealer Association Proposed—Export Promise

LAST week's meeting at Buffalo of the National Machine Tool Builders' Association had a wide range of subjects discussed before it. They covered economic, manufacturing and distributing problems. They supplied more than the usual number of suggestions likely to be carried away for adoption in part or in whole in one's business, and the absence of special provision for entertainment, recreation or even a banquet made the work of the convention notably intensive. The attendance numerically was fully as great as at earlier meetings, but regrets were frequently heard that more of the industry could not realize the value or importance of the association's activities.

The subjoined account of the meeting, which was held May 22, 23 and 24 at the Hotel Statler, Buffalo (following a conference on May 21 between dealers and machine tool builders), covers the high spots and not the glimpses given from time to time of the continuing service of the office of the association. New economic charts were on display and General Manager E. F. DuBrul touched on these and on a variety of specific business problems the association had helped or striven to solve for individual company members.

What the meeting contributed had an application broadly for the metal working industry as well as for the machine tool builder in particular.

P. E. Bliss, Warner & Swasey Co., told how the business of his company is under a budget control system, whereby not only shop activities, but selling, collecting, disbursing and other departments are operated in accordance with a program adopted for a whole year in advance after conference; advantages and success of the plan are reported below.

President Ralph E. Flanders of the association described a new layout of shop at the plant of the Jones & Lamson Machine Co., showing an arrangement to secure the continuity and intensity of manufacture characteristic of the automobile plant—a design of plant owing its development to a discovery of the need of reducing overhead (as had been the unit labor cost) and resulting in a change in design of machine tool as well.

In his address as president, Mr. Flanders had some thought-provoking things to say of the future, and W. A. Viall, Brown & Sharpe Mfg. Co., in a retrospective and introspective talk had some encouraging observations in regard to the machine tool builder's status.

H. P. Dix, Wilmarth & Morman Co., explained a simple cost finding system, which brought forth in discussion several uncomplimentary references to overdetailed systems requiring a multitude of clerks, cards and calculations.

Harry Tipper, of *Automotive Industries*, outlined the results of an exhaustive investigation into the absorptive power of the automobile industry for machine tools, presented each member a bound volume covering the analysis, and won a special resolution of acknowledgment at the concluding session of the meeting.

Bright Side of Business Picture

A REASSURING note of better times was sounded by W. A. Viall, secretary Brown & Sharpe Mfg. Co., who in the first scheduled address of the meeting said there was little call for the gloom settling over the conversations of the day. He recounted previous periods of depression with their succeeding periods of prosperity even under conditions fully as adverse as they are today and described some of the seemingly green pastures in other periods, which proved by his illustrations of what was encountered in those other fields that the pastures were not particularly green on close inspection.

"Introspective study," said he, "is always necessary to set our courses in the business world." Admittedly there had been many bad hours in the last few years, with some sales barely covering the cost of material and a part of the labor, but self-pity was a sorry state of mind, for then one blames everybody and everything but himself for conditions.

He then devoted himself to the other side of the picture—how mass production has been no small contribution to the activity of the machine tool industry; how we have thus profited by way of ease of living; that it is a privilege to have dealings with those who recognize a good piece of work and acknowledge it. He thought the members did not begin to get the good they could from the association; that they should take encouragement from present efforts looking to financing purchases after the fashion that railroad equipment purchases are arranged; that no industry will lie in a bed of roses and the future demands close devotion to one's business. Competition, he admitted, was stronger but so "we are stronger."

Possibilities of Export Markets

An address by W. H. Rastall, chief of the industrial machinery division Department of Commerce, presented in part last week in THE IRON AGE, emphasized that exporting has made the turn. In the face of conditions as they were in Europe in 1923, the machinery business done with Europe that year was 25 per cent more than in 1922. Mr. Rastall expressed the belief that Europe was on the eve of an industrial revival and there was accordingly a market there for production machinery, and yet by the very fact that Europe is facing three years of serious taxing and other industrial handicaps, it will not be in a good position in this period to compete in the non-European markets for the business in general service tools. In his opinion the outstanding fact of the American attempts to get export business is the inadequacy of the sales effort put forward.

In reporting for the committee on cooperation with the Department of Commerce, Chairman J. Wallace Carrel expressed regret that so few are taking an interest in exports, especially in view of the considerable movement of machine tools abroad observed by the department. He referred to a recent report of Mr. Rastall's to the effect that non-European markets have become more important than they were in pre-war days, and emphasized that Mr. Hoover's administration of the Department of Commerce "is now a real help to the

manufacturer. Men who have not been assisted lately will not realize the difference in attitude. Much information is cabled for, a service that was never before expected."

He added that "Mr. Rastall is booked for a trip to Europe (sailing June 3) and will be glad to undertake any missions that individual manufacturers may desire him to undertake and which he may have the time to attend to."

Ways in which the Department of Commerce can assist the individual manufacturer were enumerated by Mr. Carrel, in his committee report, as follows:

Export Helps of Department of Commerce

It is prepared to furnish information regarding the qualifications and limitations of all dealers in all foreign countries.

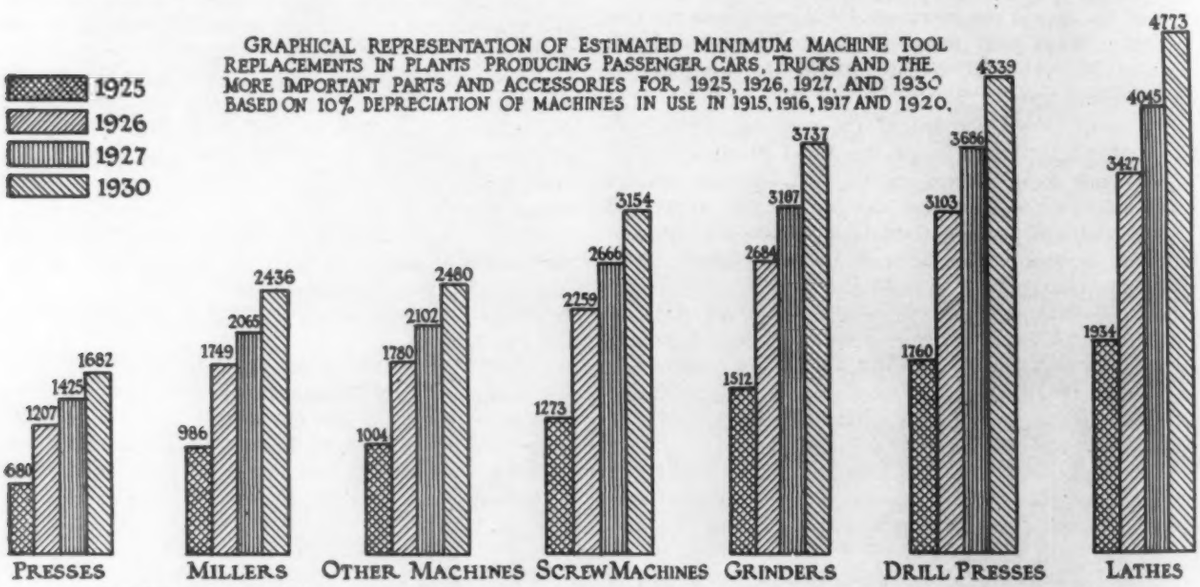
It can cooperate in handling advertising.

It is in a position to furnish much information in regard to the general reliability and standing, etc., of individual foreign buyers. Should a foreign buyer or dealer become involved the Bureau of Foreign Commerce can furnish information regarding legal and other methods that can be followed to protect American interests. It has assisted in the settlement of claims and the collection of accounts.

It has information regarding the amount of machine tool equipment imported into various countries and the percentage of participation of American manufacturers in such trade.

It has frequently acted to establish contacts between American manufacturers who wish to handle export problems on a cooperative basis. It has assisted in establishing sales connections.

It can give expert advice on packing, shipping problems and tariff problems.



ATTENTION IS DIRECTED TO THE FACT THAT THESE ESTIMATES DO NOT INCLUDE THOSE REPLACEMENTS THAT WILL BE MADE IN THE HUNDREDS OF SMALLER PLANTS PRODUCING PARTS & ACCESSORIES. NEITHER DO THEY TAKE INTO ACCOUNT REPLACEMENTS MADE DUE TO IMPROVED MACHINES SUPERSEDING THOSE NOW IN USE NOT YET LIABLE TO REPLACEMENT UNDER THE 10% DEPRECIATION METHOD.

Market of the Automobile Industry

One of the notable contributions of the meeting was an elaborate analysis of the machine-tool market in the automotive field. It was made by Harry Tipper, secretary Class Journal Co., New York, publisher of *Automotive Industries*. His presentation was made by the aid of large wall charts and then every member was given a copy of the detailed results in the shape of a 71-page book illustrated with copies of the charts. The investigation covered depreciation, obsolescence, changes in manufacture, the difference in operating practice among different automobile plants and the sizes and types of machine tools used, the maintenance field, etc. One of the most interesting charts is here reproduced.

Control of Business by Budgeting

An address by P. E. Bliss, vice-president Warner & Swasey Co., Cleveland, had to do with the control of business by budgeting, not only in the production department but in the sales department. Heads of departments submit in writing what they propose and the costs involved, making their estimates in December for all of the ensuing year. Mr. Bliss emphasized at the outset that no system can take the place of good judgment in the management of a business or that what he had found workable could necessarily be applied in other industries.

The outstanding feature of his contribution to the meeting was that estimates in every department could be made for an entire year, making use of all available information and dependable opinion, that they had come incredibly close to the actualities at the end of the year and made possible such a confidence in expectations as to justify dividend declarations in the case of one small company with what would normally be regarded as a small margin of safety and in another of releasing for periods of a few weeks sums of money of $100,000, $125,000 or $150,000, which could be put to work, as in United States Treasury certificates.

The submission in writing of a coming year's potentialities by each member of the organization was conducive to clear thinking and careful estimating, he said. In sales, this requires expectancy from among different industries and for different periods of the year. Developments affecting general business are taken into account at the first of each month in respect to the details which are likely factors for that and the next two months, but these are not allowed to affect, at least materially, the decisions at the beginning of the year.

The year's demands in the way of expenditures are likewise subject to budgeting and it is the periodic assurance of having an inflow sufficient for needs that warrants putting out surpluses at work under conditions well known by and naturally acceptable to the firm's bankers. Even the collection department has a performance record.

For the year 1923 the general average under the budgeting system proved to be 96 per cent of expectation. With the men disbursing money it becomes a matter of pride to make good and little opportunity is lost to take advantage of discounts. One net result also is careful economy in the shop program. Finally, Mr. Bliss emphasized, a business is judged by the regularity of dividends and a predetermination of earnings makes it possible to count on what may be available for such disbursements, which under another plan would take courage to make.

He urged the need of every effort to maintain morale in the machine-tool business, that it is not inspiring to be identified with an industry that drags so much of the time, and therefore those in it should have

before them well founded ideas of reasonable expectations. He admitted it to be fairly easy in ordinary times to predetermine the future, but the conclusion in December, 1922, as to what would be the profits of 1923 was realized to within 94 and a fraction per cent, and the volume of sales proved to be 95.2 per cent of the figure set twelve months previously.

The address was received with a great deal of interest and brought out numerous questions, which showed there were several cases of companies operating under a budget for some departments and generally an appreciation of guessing provided it was done on the basis of information. The budgeting of the engineering department was mentioned in the discussion as done in one plant, in the face of a claim that it "crimped genius," but is approved as preventing that same genius's taking "too much rope," and developing creations of little economic importance. A cost department in one plant has to pass on estimates of cost in connection with an idea before it is submitted to the sales department or the board of directors.

Simplified Cost Keeping

A simplified cost keeping system was described by H. P. Dix, secretary Wilmarth & Morman Co. An outstanding point in respect to it is that it aims to eliminate the elaborate systems of detail unit calculations continuously being made by a corps of clerks involving a multiplicity of colored cards, delays in the obtaining reply to a specific cost request and likelihood of errors growing out of the very detail. He made the calculation on the blackboard of a machine cost as he has the need from time to time. He found it not only close enough for practical purposes but capable of including current market prices of material as well as of labor.

Records give him the average number of hours of work in each machinery department for all the parts going into the type of machine under study. These multiplied by the average hourly wage rate give the direct labor cost in each case. Periodically, perhaps only once a year, the overhead of each department is calculated and an hourly price established. The number of hours of work in each department for each machine multiplied by the overhead hourly price gives the indirect charges.

Having labor and overhead costs for the machine, the material cost is similarly calculated. The weight of iron castings, of steel, of bronze, being a known quantity for the given machine, may in each case be multiplied by the market price at the moment and the material cost is added to the labor and overhead costs. In these material cost items are lumped together the various purchased supplies required for one machine; these have a general average total cost not greatly variable over a period of time and a relatively small item anyway in the total machine cost. This unit average is only occasionally revised. To the machine cost thus calculated a percentage is added for selling expense and a percentage for profit and safety and for providing for the dealer's commission.

In the Wilmarth & Morman plant one clerk takes care of all the records of the cost keeping as well as other records. These include perpetual inventory records of material, raw and finished material. More than the usual amount of information is contained on the cards, and the cards pass through the hands of the purchasing agent when material is needed. This information covers such items as name of supplies, price paid, order number so the purchasing department can refer to this in further buying, the time required for delivery, and the rate of flow through the shop, etc.

For each machine also there is a master sheet or family tree of the machine referring to the perpetual inventory cards and having to do with the supplies and equipment of that machine. The work cards are used for checking the amount of wages in arriving at labor charges in connection with the scheme. The overhead is arrived at in a usual way, being a total of the direct charges for foremen and salaries chargeable to each department, charges for supplies, fuel, etc., the department's share of the taxes, etc. The hourly department overhead is the quotient of the total so obtained divided by the number of productive hours, so-called.

The total number of hours accepted for each machine is not likely to vary materially; and generally, Mr. Dix held, variations are no greater than the errors creeping into elaborate statistical calculations. Nor were there, he argued, great variations in weights of a given material going into a given machine and his plan, as stated, had the advantage of providing for the use of current market prices of supplies and material.

President Flanders commented on the Dix plan as cost finding from the top down rather than from the bottom up; that it did not depend on the painstaking method of detailed fractional cost determination of single parts or pieces.

Mason Britton, of the *American Machinist*, gave an illustrated address, entitled the "Buying Structure of Industry," emphasizing how the market for industrial machinery is reached effectively through the medium of the business press. Based largely on an investigation by Ernst & Ernst, the address, illustrated by means of lantern slides, had been exhibited at the triple supply convention in Cleveland earlier in the week.

Code of Ethics for the Industry

H. M. Lucas, Lucas Machine Tool Co., Cleveland, for the committee of which he is chairman, reported progress on the matter of ethics, expressing an intention of using as a basis for the machine tool builders the 15 items recently formulated by the Chamber of Commerce of the United States.

The matter of a standard catalog size was discussed and the question finally was put into the hands of the following committee to report at the October meeting: S. T. Massey, sales manager Heald Machine Co., Worcester; Norman D. McLeod, Abrasive Machine Tool Co., East Providence, R. I., and Wallace Montague, Norton Co., Worcester.

Radical Departure in Shop Layout

President Flanders described by means of lantern photographs a plant layout and method of manufacture, now a feature of the Jones & Lamson plant, that marks a notable departure in industrial plant engineering. It was developed out of a realization that while for years careful attention to management had resulted in a steady downward labor cost per unit of output, the overhead factor had almost unsuspectingly been gradually increasing. Attention was accordingly focussed on what could be done toward eliminating lost motion in the trouble hunting jobs among foremen and toward minimizing the amount of records seemingly necessary in routing and costing work. It resulted in a radical rearrangement of operations of machining and in a more or less automatic control of the stocks of materials without the use of such records as those of continuous inventories. It meant substantially a complete divorcing of the production of machines from the making of repair parts, so that such manufacture is conducted essentially as a separate business without any physical connection with any other department of the business of the Jones & Lamson Machine Co.

Mr. Flanders devoted himself to the plant for making the turret lathes. Incoming castings, forgings, machinery steel and the like are unloaded at various points along one side of the shop opposite the transverse section of the shop where the machining operations will be performed on the pieces. Each transverse section of the shop is a place for machining a definite part of any of the turret lathes and that only. In other words, the shop is not divided by departments according to process, such as planing, milling, etc., but altogether along the lines of the automobile plant, each section having the specific task of turning out a certain machined part, and thus being in miniature a manufacturing plant, whatever general class of tools is necessary.

Emerging so to speak from each such department the completed part reaches storage bins extending lengthwise and parallel with the raw material bins at the opposite or entrance ends of the transverse machining department. Parallel with the finished parts bins are benches for making part assemblies, these and the adjoining bins being opposite those departments supplying the parts for that assembly. This means a

direct short flow from raw to finished product across the plant. The machines are crowded together as close as possible and there is a short time in transit through each department. Thus there is practically no space for holding material around the machines, little chance for overlooking material, because it is under the direct observation of each department foreman and there is a minimum amount of material in process at any time.

Parallel with the sub-assembly benches is a runway for the complete assembly of the turret lathes, this also being after the fashion of the moving assembly conveyor of the automobile plant. Instead of a conveyor, a series of special trucks start at one end of the plant, and each truck is moved step by step, remaining long enough at each station for each part to be mounted, until it reaches the far or shipping end. Each part or sub-assembly has come crosswise through its corresponding machinery department and through the bins and sub-assembly to the assembly aisle. A view along this aisle shows a line of trucks each carrying a machine frame or bed. The machine is built up from station to station with the result there is a substantially steady flow of finished machines going into the testing and final inspection department.

The study of the way to reduce overhead not only led to the new plant layout but even to a new design of machine. For example, gears and gear ratios for three types of turret lathe, including the double spindle type, are identical in almost their entirety in the driving head. Fixtures on the shop tools are designed to take various sizes but otherwise identical parts for any of the machines, and likewise such parts as the machine beds are designed readily to admit using a common form of fixture. This means that beds for different turret lathes may be passed indiscriminately through, say, the first department without causing a loss of time in the actual work of machining. An elaboration of his description of the development may be made the subject of a paper by Mr. Flanders at the December meeting of the American Society of Mechanical Engineers.

Association's Catalog for Foreign Buyers

An informal report from the catalog committee of the association, which distributed abroad a catalog calculated to facilitate foreign inquiries for machine tools, was that a questionnaire is under consideration to ascertain if another edition seems worth while. If it should be, it was said not to be possible for two years, and one suggestion was that it should include supplies and accessories, such additional advertising to help defray the cost. The questionnaire is intended to bring out what if any business could be traced to the catalog.

Progress was reported by the standardization committee toward the formulation of standard tee-slots, with a committee meeting in connection with the American Society of Mechanical Engineers in Cleveland in the week of May 26.

President Flanders reported receiving some $1500 from members of the association toward the fund for the research in the strength of gear teeth and from all sources a total approaching $3000. The making of the testing machine is in progress at the Hugo Bil-Gram works and plans for research are under way in behalf of a committee of the American Society of Mechanical Engineers at the Massachusetts Institute of Technology.

Classification of Used Machines Suggested

Considerable discussion arose over the second-hand machine problem. One suggestion was that used machines should be given a classification, so that buyers could know in just what group a given used machine belongs in giving it a money value. For example, a second-hand or rebuilt machine, up to the minute, standard or single-purpose, of latest design, would be class A under the scheme. Then a machine of less advanced type, perhaps of cone drive, rather than gears in head type would be class B. And class C would cover machines built, say before 1914 or generally regarded as reaching the stage of consignment to the junk pile. Another idea was voiced of attempting to give machines a definite money value depending on their age, as is now attempted in evaluating old automobiles. One difficulty in establishing values of rebuilt machines appears to lie in a practice of eradicating at least one of the identifying serial numbers given to machine tools, and the plan was offered of stamping on a machine the date of shipment from the maker's factory.

The outcome of the consideration of the subject was the appointment of a committee to study the question and report at the October meeting. Special importance was placed on the slowing up in new factory building construction and the consequent increasing prominence of the replacement market, with a possible bidding up of old machines. Also one member told of his practice of allowing a 5 per cent discount if the purchaser agreed to scrap the old machine and another urged members to refuse to supply repair parts for a machine so old as likely to bring the maker's name in disrepute for failure to perform.

The committee on classifying second-hand machine-tools is composed of Henry Buker, Brown & Sharpe Mfg. Co., Providence; J. B. Doan, American Tool Works Co., Cincinnati, and C. J. Stillwell, Warner & Swasey Co., Cleveland.

Service to Appraisal Companies

Another question which came in for considerable discussion was the matter of giving values of machinery to appraisal companies. Owing to the necessity of consulting records for the sizes and types of machines of varying ages, it was urged that a charge of $2 to $5 could well be made for each item, thereby covering the cost of the search, which is charged for to its customer by the appraisal company. It was urged as a good thing to encourage such appraisals as many manufacturing companies need to realize their earnings are inadequate from the standpoint of the replacement value of their equipment. It appeared some members had been giving the information free and others charging only 50 cents per item, while not a few made charges of $1 to $5. Freely sending price lists on request of appraisal companies was not favored as such prices have little or no relation to machines being appraised.

It was brought out at the concluding session of the meeting that Dean E. F. Gay, formerly of Harvard University, was now assisting Secretary of Commerce Hoover in studying what the department may do for American business in the way of domestic as distinguished from foreign business. It was emphasized that the department would welcome suggestions and that among other things it was making a study of cancellations. The impressive investigation of the automobile industry as a market for machine tools, as described to the meeting by Harry Tipper, brought out requests, not formally expressed, that similar studies be made for other industrial possibilities. Members of the association plan informal conferences with the Department of Commerce.

General Manager Du Brul's Report

Holding up as an example the cooperative work which other industries are doing to further the demand for their products, Ernest F. Du Brul, general manager of the National Machine Tool Builders' Association, made an appeal to the members of that organization at its meeting at Buffalo for increased activity and greater expenditures. He cited the cement industry, which, he said, spends $500,000 a year and employs a staff of 342 persons, including 200 trained engineers. Its annual output in 1919 had a value of $175,000,000, whereas the machine-tool industry in the same year produced tools valued at $212,000,000.

Mr. Du Brul recommended programs of standardization, elimination of unnecessary sizes and types, technical research work, financial and market research and better salesmanship methods.

His resume of conditions in the machine-tool industry was not encouraging, showing that sales in the first four months of this year averaged only 33.8 per cent of the average sales in 1920, a peak year. The first four months of 1923 were not much better, showing sales of only 41.4 per cent of the 1920 average.

Since January, 1921, 57 machine-tool companies, which were members of the association, have either left the machine-tool field or are in the hands of receivers' or creditors' committees. Others have resigned from the association, in most cases because of financial pressure. "It is no wonder, then," said Mr. Du Brul, "that some machine-tool builders are distressed over present and prospective conditions." But he went on to say:

"No matter how gloomy we may feel, the whole industry is not going to die. The world will still need some master tools of industry, and they will be furnished by the companies whose executives are fighting with their brains, and not depending on their money alone. Purchases during last year seem to have been largely of high production machines that made old processes obsolete by great reductions in the cost of doing work. Such machines got business where there was none to be had on standard machines of older types.

"To stay in business, the machine tool builder must count it a necessary part of his regular operations to be designing newer and better machines.

"The big financial problem today is what to do with the excess capacity that exists here and there in the industry. In some cases it is a liability and not an asset. No executive likes to see his losses mounting and his cash resources dribbling away. When that happens he naturally wants to do something about it. The question is, What can he do successfully? There are not many things that all can do. Some can bring out new and revolutionary designs that will create some new demand. Perhaps all could improve the salesmanship that they must depend on to get orders.

"One thing cannot be done successfully, judging from experience, and that is to clear an oversupply of machine tools by bargain sales below cost. The bargain sale does not increase demand, because men buy machine tools only as needed to produce other goods, and making disastrous prices on machines tools has no perceptible effect on the demand for the product of the tools.

"Nor can one profitably capture enough market in dull times to fill up his shop while his competitors sleep. Trying to do so simply creates demoralization, and ends up in the bankruptcy of a whole industry. Cut-throat competition has never yet been found to be a social benefit. It is uneconomic because it is wasteful of capital previously accumulated. Society would be much better off if money lost by cut-throat competition had been invested in research, where it would finally result in better designs. Cut-throat competition is a confession of inability to sell goods on their merits. Many a concern that has been wrecked by cut-throating could have prospered if the same amounts of money had been spent on better salesmanship. Many another concern wrecked by foolish cut-throating could have prospered had its executives taken enough time and thought to analyze its problems and to find a true and sensible solution for them. No industry requires more managerial ability nor more high grade salesmanship than the machine-tool industry, and particularly so at this time of stress.

Necessity for Research

"It is up to each industry to solve that industry's problems. A whole industry's problems are solved quickest and best by exchanging information, reporting experience as to successful and unsuccessful methods, cooperating in business research and in technical research. That involves associated effort and real association work. No individual can get along as fast or as far by depending on himself alone. How fast and how far an industry gets along will depend in great measure on how much it does along cooperative lines.

"I plead for more activity and for definite programs of standardization of tool holding and work holding elements. I plead for elimination of unnecessary sizes. I plead for technical research that will show all how to make better machine tools. I plead for financial research that will show all how to best manage the finances of a machine-tool business. I plead for market research that will show all how best to sell the master tools of industry. Even with the members actively interested, the association cannot do more than your contributions in dues will finance. No matter how fine and practical a program may be presented, it must fall flat unless backed up with money, and with a will to pool information."

Mr. Du Brul then discussed the work done for association members on questions relating to Federal taxes. He said that the industry had overpaid millions of dollars in taxes and much of this would never be recovered.

Results achieved in regional meetings of tool builders were commented on by Mr. Du Brul as follows:

"During the months of February and March, your president unselfishly devoted much time to presiding at regional meetings at Chicago, Rockford, Ill., Cincinnati, Cleveland and Worcester. Each meeting was very well attended. At all meetings, consideration was given to such problems as those of excess capacity and possible ways of utilization; the studying of turnover of working capital, the control of inventory and other problems of management in the machine-tool industry, in relation to its widely fluctuating demand. Consideration was also given to possibilities of expanding the demand by driving against obsolete machines of which so many are in use everywhere.

"At the Chicago meeting Mr. Kearney made valuable contributions to the discussion of the probable outlets for machine tools and Mr. Dix outlined the results secured by a simple cost and budget system that had been installed in the plant of the Wilmarth & Morman Co. At the Cincinnati meeting remarks on selecting machine tool salesmen and the types of men that make the best salesmen were given by Mr. Joseph Pflum, local representative of the Heald Machine Co. At the Cleveland meeting Mr. Burger of the Warner & Swasey Co. discussed 'Shop Control Through Budgeting.' At the Worcester meeting Mr. Viall spoke on 'The Type of Organization Necessary to Make a Variety of Product.' Mr. J. C. Spence of the Norton Co. spoke on 'Making the Machine Tool Industry Attractive to High Grade American Labor.'

"One round table topic that brought out much discussion and information at these meetings was 'The Cost of Making Repair Parts.' Members reported that a study of these costs from beginning to end showed that prices charged for repairs had not covered the costs. This discussion on cost of repairs showed the necessity of greater study in more detail of what it costs to get out a repair order, including the time of entering the order, arranging for production of the repair part as a special piece, disturbing regular production, etc.

Meetings of Cost Accountants

"Cost and accounting methods are by no means perfect. As a forward step in their improvement, we called together two groups of accountants from some of our larger companies, one group meeting in New York on April 11, and the other in Toledo, on April 24. These meetings were for the purpose of interchanging ideas among accountants who have actual charge of cost and general accounting. It was felt that if the larger companies could be interested in this sort of work it would expand and in time prove valuable to the whole machine tool industry as it has in other industries.

"These men brought out the difficulty that various companies had met in properly preparing claims for tax relief and some interchanges of information resulted to our knowledge. Another lively topic was the improvement of methods for cost analysis. A third interesting discussion dealt with methods of presenting and charting information so that the executives would get effective pictures of what the accounts showed.

"Based on the experience of these two meetings and tallying with the experience of other organizations, it appears that only by enlisting the interests of the men who are doing the work can we get costs figured on the uniform basis of principles adopted by the association after mature deliberation. The executive naturally depends on these men for results, but unless the cost men know how important it is to use the proper basis for their work the results are not obtained. It developed that very few of the accountants were including interest on investment as a part of their cost

of production. They had been misled by auditors of the traditional school to believe this was not proper. So their executives never have gotten true cost pictures, particularly as to the cost of doing work of varying size on varying types of equipment. Nor had many of them shown the cost of necessary idleness as a part of the cost of production. No doubt many fallacious prices have been based on such incomplete data, and until the executives insist on the association plan being put into effect, they will continue to be deceived, to their own company's detriment and to that of the whole industry."

Other Subjects

Other subjects discussed by Mr. Du Brul were the metric system, standard data sheets for machine tools and the conferences which have been held to determine the ideal division of territories for handling machine-tool sales. Mr. Du Brul voiced the opposition of the association to the metric system, saying that while the system has been legal since 1866 it has made little progress because our own system has proved well adapted to our needs. "Continued agitation of ill-informed sentimentalists," he said, "will lead to injudicious legislation for the compulsory use of the metric system unless counter argument shows people how little it is worth and how much it will cost."

Substantial progress on standard data sheets was reported. A. L. Evans, the engineer who first proposed the idea, has received letters from more than 50 users of machine tools indicating a desire to adopt the form. Machine-tool builders who have definitely adopted the form were said by Mr. Du Brul to be the following: Acme Machinery Co., Cleveland Automatic Tool Co., the Blomquist-Eck Co., Cleveland Planer Co., Colburn Works of the Consolidated Machine Tool Corporation, Lucas Machine Tool Co., Warner & Swasey Co., all of Cleveland; Acme Machine Tool Co., Avey Drilling Machine Co., Cincinnati-Bickford Tool Co., Cincinnati Shaper Co., American Tool Works Co., King Machine Tool Co., R. K. Le Blond Machine Tool Co., Lodge & Shipley Machine Tool Co., John Steptoe Co., all of Cincinnati; Jones & Lamson Machine Tool Co., Springfield, Vt., and Landis Tool Co., Waynesboro, Pa.

A conference of machine tool builders and distributers was held at the association office on March 12, Mr. Du Brul reported, to discuss further an outline for ideal territories and the division of commissions between agents where sales are made in one territory for shipment to another, or where more than one agent is connected with a transaction. A report of a joint committee appointed to consider this subject was presented to the convention by J. Wallace Carrel, its chairman.

Conference of Machine Tool Makers and Dealers

THE conference of machine tool builders and distributors occupying the morning and afternoon of Wednesday, May 21, proved there was a desire, and a willingness to compromise to meet it, for the setting up of ideal territories over the United States, but it proved also that there is not any clear sentiment, at least among the dealers, for formulating a broad principle or rule governing the prorating of commissions on orders placed in one territory for shipment into another. The discussion was active and prolonged. Almost as many variations of the problems were mentioned as there were speakers and there was clearly no crystallization of opinion toward a simple disposition of the question. The volubility of the discussion arose from different speakers illustrating, by describing specific cases the difficulties of splitting commissions. The net result was that the joint committee of machine tool builders and dealers, which brought recommendations to the conference, was asked to consider the question anew with the help of written constructive suggestions which the dealers voted they would supply.

The meeting was well attended, with probably as many as 50 dealer and 60 machine tool builder representatives present. Most of the morning session and part of the afternoon were spent in discussing the joint committee's delineation of ideal territories, chiefly in respect to the proper allocation of certain border line regions. For example, there was the question of Mahoning County, Ohio, of which the county seat is Youngstown, being considered a part of Cleveland or of Pittsburgh territory. Similarly, the allocation of certain northern counties of Indiana to Chicago and southern ones to Cincinnati; the question of putting certain counties in lower Michigan into Chicago or Detroit territory; of the proper division of Illinois as between St. Louis and Chicago, and of the upper Michigan peninsular as between Chicago and St. Paul or Minneapolis. About 20 or 25 dealers by name agreed to submit written views to the committee, so that subsequently a map of the ideal territories may be drawn up with definite demarcation of those boundaries at present in doubt.

To Consider Organizing Dealers' Association

J. Wallace Carrel, vice-president Lodge & Shipley Machine Tool Co., Cincinnati, chairman of the joint committee, was elected chairman of the conference and presided throughout the deliberations. Late in the afternoon, following the adjournment of the conference, an informal meeting of the dealers was called by Roy Porter, Marshall & Huschardt Co., and a committee, including Tyler W. Carlisle, Strong, Carlisle & Hammond, Cleveland; George E. Merryweather, Motch & Merryweather Co., Cleveland, and H. L. Swind, Swind Machinery Co., Philadelphia, was appointed to determine what could be done toward organizing a machinery dealers' association, possibly one closely affiliated with the National Supply and Machinery Dealers' Association, of which some of the dealers are members.

Splitting Commissions Between Dealers

As to the split commission question, there were those who favored an equal division of the commission between the dealer who took the order and the dealer into whose territory the machinery was shipped. Others favored a division other than the 50-50 basis, while still others preferred to leave matters as they now stood, each case being regarded as having its own solution and not amenable to any arbitrary rule. Several motions looking to definite action, both in the case of sales to manufacturing consumers and in the case of sales to railroads, failed to carry, with only a part of the conference voting on either side of the question.

Some stress was laid on the claim that a split commission failed properly to recompense a dealer either for work in cultivating an order or in taking care of the financial end of the business.

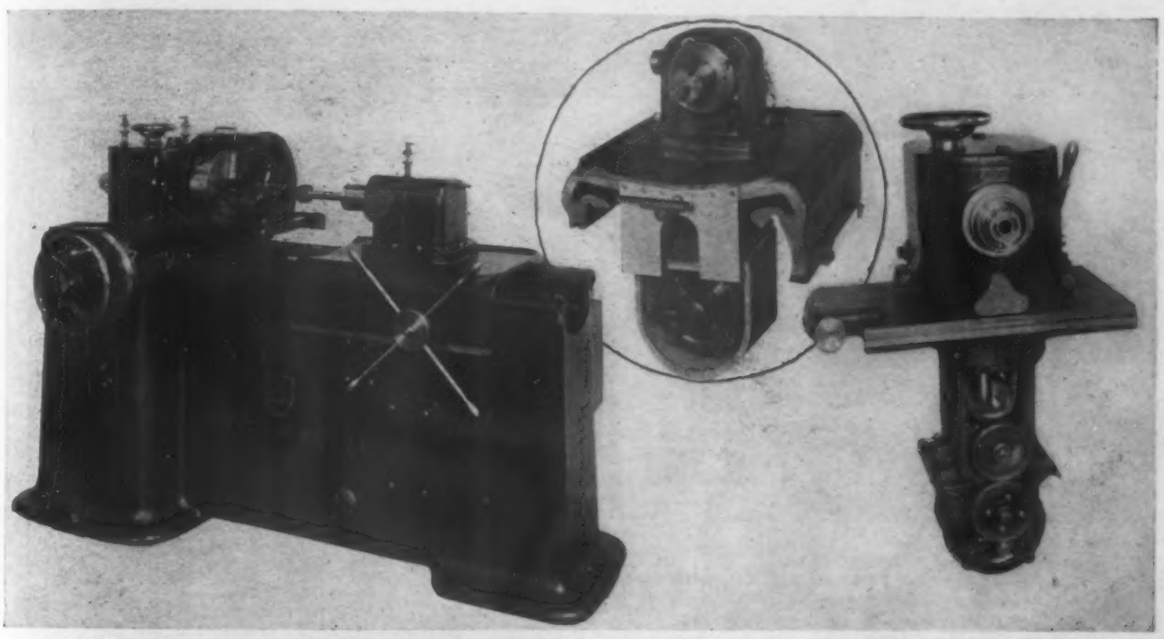
Among those present were the following:

Ogden R. Adams, Rochester, N. Y.; F. F. Barber and L. M. Wiertz, of F. F. Barber Machinery Co., Toronto; George H. Cherrington, Brown & Zortman Machinery Co., Pittsburgh; C. L. Campbell, Cadillac Machinery Co., Detroit; R. L. Crane, Crane-Schiefer-Owens, Inc., Buffalo; John Cetrule, New York; J. W. Wright, Colcord-Wright Machinery Co., St. Louis; A. Morris Cary, Cary Machine & Supply Co., Baltimore; C. C. Wright, E. C. Coventry and J. C. Whitney, Cleveland Tool & Supply Co., Cleveland; C. A. Odergaard, Federal Machinery Sales Co., Chicago; C. H. Gosiger, C. H. Gosiger Machinery Co., Dayton; Albert Steadfast, Hill Clark Co., Boston; C. E. Moore, Herberts Machine & Supply Co., Los Angeles; J. R. Lees, Hendrie & Bolthoff Mfg. Co., Denver; R. J. Lynd, Lynd Farquhar Co., Boston; George E. Merryweather, Motch & Merryweather Co., Cleveland; G. K. McMullen, McMullen Machinery Co., Grand Rapids; R. W. Phelps, Henry Prentiss & Co., New York; L. A. Smith, Purinton & Smith, Hartford; H. W. Cowan and Charles Allinger, C. A. Strelinger Co., Cleveland; T. W. Carlisle and L. J. Hammond, Strong, Carlisle & Hammond, Cleveland; R. W. Carter and H. A. Smith, H. A. Smith Machinery Co., Syracuse; W. K. Stametz, Pittsburgh; Chris Seifreat, Seifreat Elsted Co., Dayton; George A. Bauer, W. E. Shipley Co., Philadelphia; H. P. Cornelius, Homer, Strong & Co., Buffalo; J. F. Luby, Wolverine Machine & Supply Co., Detroit; H. L. Swind, Swind Machinery Co., Philadelphia; Roy Porter, Marshall & Huschardt Co., Chicago; H. E. Barney, Laughlin-Barney Machinery Co., Pittsburgh; George W. Hurd, Marshall & Huschardt Co., Indianapolis.

Hand-Operated Internal Grinder for Tool Room Work

The hand-operated internal grinding machine illustrated, which is adapted to tool room and other work of which only a few pieces of a given size are to be ground, is a recent addition to the line of the Giddings & Lewis Machine Tool Co., Milwaukee. It is called the Tero and incorporates many of the features of the company's Teromatic automatic internal grinder which was placed on the market about a year ago.

The machine is universal and is designed to grind straight holes, blind and multiple diameter holes, and taper holes up to an included angle of 30 deg. Holes of ½-in. diameter and larger may be ground. The swing over the ways is 16 in. and inside the standard chuck guard, 13 in. Self-contained construction is a feature, the machine being fully motor driven. The only belt employed is that between the wheel spindle and driving motor. Rigid construction and the provision of sufficient weight to eliminate vibration are general features emphasized.



Hand-Operated Internal Grinder for Work on Straight Holes, Blind and Multiple Diameter Holes and Taper Holes Up to an Included Angle of 30 Deg. Self-contained and rigid construction are features. The detail views are of the wheel head and work head carriages respectively

The base is of box type with the water tank cast integrally, and with cored conduits to protect the wiring from moisture. The ways, one of which is flat and the other of Vee type, are scraped to master plates and are adequately protected from water and abrasive dust. The workhead carriage, an illustration of which is shown herewith, is a complete general assembly made up of the workhead, the change gear box and the motor as sub-assemblies. The entire unit may be conveniently dismounted and returned to place without danger of misalinement or misadjustment.

The workhead spindle is driven at six different speeds by a 1-hp. motor, through the change gear box, a given speed being produced by turning the hand-wheel to one of six indicated positions. The motor is provided with ball bearings, grease packed, and the change gears run in oil. The silent chain drive to the spindle is lubricated by overflow from the spindle bearings. A friction brake clutch in this head permits of disengaging and stopping the spindle without shutting-off the motor. Swiveling of the head for taper grinding is by means of a micrometer screw, 0.001 in. to the foot.

The spindles are of high-carbon steel, heat treated, and are provided with an integrally forged 8-in. flange for holding the work chucks. The latter, which may be of indefinite variety, are centered and alined with the spindle by a hardened pilot attached to its flange. The bearings are large, of bronze and are dust-proof. Each bearing is lubricated by an individual oil cup. The hand feed wheel, with graduated dial to 0.0002 in. and provided with adjustable stops, is conveniently located.

The carriage bearings are long, and are proportioned to prevent flexure or distortion when grinding. It is claimed that the balance provided above and below the reciprocating mechanism, which consists of rack, pilot wheel and pinion, eliminates any tendency toward vibration of the wheel spindle as it enters or leaves the work, regardless of the speed of operation. The wheel spindle is driven by an endless fabric belt from a 3-hp. ball-bearing motor, which is suspended directly beneath and reciprocates with the carriage. A ball-bearing idler is provided to take up belt slack. Bearings are packed in grease and are said to require little attention. The wheel-head carriages may be conveniently removed and remounted.

The wheel spindles are of the ball-bearing type and are arranged for quick mounting in the spindle head. The wheel truing device may be moved from its working position to facilitate gaging. By setting the diamond in correct relation with the periphery of the hole to be ground, and then dressing just before the finishing pass of the wheel, duplication to relatively close tolerances may be obtained without gaging.

The water pump, which is of the centrifugal type, is driven by a 1-hp. motor through a Grundy flexible coupling. When the grinding wheel enters or withdraws from the work the water is turned on and cut off respectively.

The maximum travel of the wheel carriage is 21 in. The distance from the center of the work spindle to the floor is 44 in. The floor space occupied by the machine is 4 x 7 ft., and the weight, net, is 3700 lb.

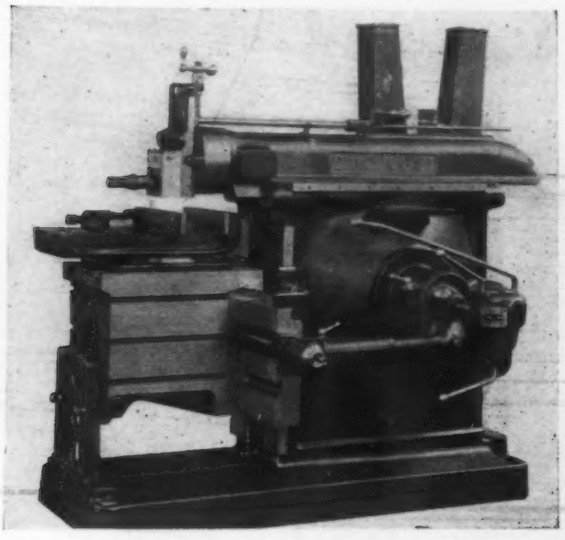
April production of steel barrels reported by the Department of Commerce from 29 establishments operating 34 plants amounted to 416,628—the largest month of the year. It compares with 394,478 for March. Shipments slightly exceeded production, being 420,129 barrels, leaving on hand at the end of the month 53,571 barrels. Unfilled orders at the same time aggregated 614,102 barrels, or about six weeks' production at current rates.

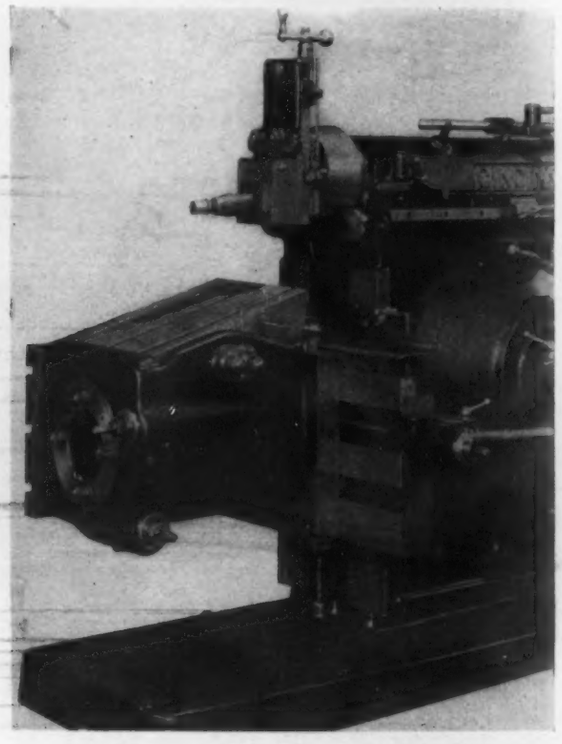
TOOL-ROOM SHAPER

Belt-Connected Motor Drive Provided—Universal Swiveling Table a Feature

A tool-room shaper incorporating the same mechanical features as the Climax shaper described in THE IRON AGE of Nov. 29, 1923, and available in the same number of sizes, 16 in., 20 in. standard and heavy, 24 in. standard and heavy, 28 in. and 32 in. strokes, has been placed on the market by the Cincinnati Shaper Co., Cincinnati.

The features include eight-speed internal transmission; completely automatic and visible oiling; smooth, cam-actuated feed in place of ratchet feed; direct-reading indicators for feed, speed and length of stroke; conveniently located controls for all movements; and improved guards to ram ways and cross rail.





Eight-Speed Internal Transmission, Automatic and Visible Lubrication and Cam-Actuated Feed Are Features. A universal swiveling table having one solid face and a second face with a rocking top as shown in the view at the right is also a feature

The machine is available equipped with either single pulley or with motor drive. The features of the single pulley drive and internal transmission were set forth in the description of the Climax shaper in the issue noted above. The motor drive is a departure from the usual gear connected methods employed. Special effort is being made to standardize on a belt-connected motor drive, in the belief that all the possibilities of the gear-connected drive can be incorporated, and also additional features not possible with the direct connection.

A constant-speed motor is employed, being mounted at the rear of the machine and bolted to the base and column. It is connected to the main driving pulley on the shaper by an endless belt. The size and speed of the driving pulley permits the use of an 1800-r.p.m. motor, which is said to provide a neater and less expensive installation than otherwise. The belt connection is regarded as an advantage in acting as a buffer between the motor and tool in case of shock. The belt is adequately guarded, and the change from single pulley to motor drive may be made conveniently.

An outstanding feature of the shaper is the universal swiveling table, which is arranged to swivel about a heavy trunnion that extends the full length of the table and is cast solid with the apron. A worm and worm wheel, operated by a crank wrench, revolve the table to any angle or position desired, the angular position being indicated on the graduated plate on the front end of the trunnion.

The table has one solid face similar to the standard shaper table. The second face is a rocking top set well into the body of the table, and has a movement of 15 deg. either above or below the horizontal axis at right angles to the trunnion. This movement is controlled also by a crank through a worm and worm wheel, the setting being indicated by graduations. Clamping means are provided for holding the tilting top in any position and at the same time assuring a solid bearing for it in the body of the table. In adjusting this rocking surface to various positions, there is no change in the mean distance between the table and the tool post so that no loss of working distance under the tool occurs in any position.

The table is furnished without an outer support, which obviates the cost and inconvenience of a complicated member on a class of work where it is not generally needed. Instead, the table has been made unusually heavy, the apron bearing on the rail, for instance, being 6 in. wider than that of the standard box tables on the company's Climax shapers. This table is said to have been tested to carry a 2000-lb. load without binding on any of its sliding surfaces.

Either single or double screw vises are available. The double screw vise has the advantage of clamping taper pieces without the use of extra jaws or shims, while the single screw offers the advantage of a little faster operation. A feature of both vises is the design of the swiveling base which employs only four bolts for both swiveling and securing the vise to the table. This permits reduction in the height of the vise above the table over that of former vises.

The machine is provided with automatic power feed to the head with a ball lever for engaging or disengaging this movement. Means are provided for stopping automatically the down feed at any desired depth which has been set either with gage blocks or which has been previously determined as in the case of slotting.

Speeds up to 138 strokes per min. for fast work in short strokes are provided. The feeds range from 0.010 in. to 0.170 in.

Various attachments for the machine, such as index centers, circular feeding table and cone arbor, are available.

Slight Gain in Iron and Steel Exports

Outgoing Shipments Still Much Below Average of Last Year and Only Two-Thirds the Pre-War Average

WASHINGTON, May 26.—Representing a gain of only 7658 tons over March, exports of iron and steel products in April of this year amounted to 131,276 gross tons, valued at $17,832,432. For the ten months ended with April they aggregated 1,691,437 tons, valued at $206,615,467, as against 1,441,757 tons for the corresponding ten months ended with April, 1923.

Although the total exports were 46,000 tons less in April than in the corresponding month of 1923, some items showed a decided increase. Pig iron was 4117 tons against 1844 tons. Scrap was heavily advanced from 4571 tons to 11,895 tons, and boiler tubes, welded pipe and fittings showed an increase of almost 7000 tons. To offset these, however, there was a decrease in iron and steel bars of more than 5000 tons, 3400 tons

Exports by Countries of Destination

(In Gross Tons)

	April		Ten Months Ended April	
Plates:	1923	1924	1923	1924
Canada	13,167	10,101	67,642	64,851
South America	121	158	890	958
Japan	.....	.....	1,489	911
Cuba	35	7	609	519
Philippine Islands	.....	148	590	683
Mexico	51	24	953	594
Galvanized Sheets:				
Canada	4,536	2,081	25,998	95,468
Cuba	1,198	532	6,576	7,767
Chile	145	156	2,414	1,950
Argentina	203	128	4,115	4,661
Philippine Islands	299	481	9,229	8,396
Central America	712	391	3,275	3,252
Japan	500	226	3,067	13,626
Mexico	905	459	4,886	4,286
Colombia	841	163	4,235	2,182
Black Steel Sheets:				
Japan	3,818	471	24,167	108,933
Canada	5,990	4,596	44,855	33,608
Argentina	6	104	2,718	1,032
Cuba	72	6	693	1,220
Philippine Islands	.....	18	125	353
Tin Plate:				
Canada	3,726	1,756	18,394	23,952
Japan	4,046	327	18,452	41,269
Argentina	645	167	3,026	9,756
Uruguay	412	10	1,988	2,145
China	957	1,554	1,785	22,219
Chile	177	28	696	2,631
Cuba	744	154	2,633	4,081
Mexico	69	269	1,977	2,641
Hong Kong	775	12	1,232	6,220
Italy	1,171	667	2,266	2,393
Barbed Wire:				
Cuba	.....	726	.....	7,182
Argentina	741	178	9,941	7,010
Australia	863	231	7,738	3,399
Mexico	291	282	3,097	3,036
British South Africa	651	692	4,404	3,928
Colombia	259	486	4,772	3,715
Brazil	774	3,456	11,671	14,370
Canada	876	63	4,225	2,136
West Indies	702	.....	7,572	.....
Steel Rails:				
Canada	2,301	934	21,710	45,148
Japan	6,118	848	73,442	80,147
Cuba	2,671	1,697	30,480	33,098
Chile	.....	77	5,123	9,298
Brazil	51	3	2,362	5,677
Philippine Islands	924	61	6,627	4,101
Chosen	943	.....	11,669	1,178
Honduras	826	50	7,432	4,019
Kwan Tung	1,445	.....	1,445	12,945
Mexico	131	661	4,776	6,888
Colombia	256	695	8,639	3,563
Argentina	.....	503	1,179	1,366
Galvanized Wire:				
Japan	3,572	74	8,273	15,902
Argentina	577	85	14,009	6,898
Canada	1,541	1,030	12,043	12,274
Australia	571	150	9,187	3,624
Brazil	378	124	6,165	7,172
Mexico	315	390	2,958	2,835
Cuba	195	209	1,534	1,997
United Kingdom	239	115	2,085	2,092
Chile	172	12	4,120	1,449

Exports of Iron and Steel

(In Gross Tons)

	April		Ten Months Ended April	
	1923	1924	1923	1924
Pig iron	1,844	4,117	27,083	34,222
Ferromanganese	1,505	1,028	2,935	3,115
Ferrosilicon	38	156	792	1,022
Scrap	4,571	11,895	31,893	83,974
Ingots, blooms, billets, sheet bar, skelp	11,247	6,719	90,901	69,184
Wire rods	3,616	1,556	17,719	34,487
Iron bars*	.....	413	.....	5,602
Steel bars	16,251	10,720	135,785	112,918
Alloy steel bars	96	425	2,204	2,693
Plates, iron and steel	14,027	10,648	86,718	83,181
Sheets, galvanized	13,706	5,998	89,307	78,881
Sheets, black steel	10,502	5,482	79,174	152,939
Sheets, black iron	1,510	818	9,019	9,482
Hoops, bands, strip steel	4,617	3,243	31,239	31,915
Tin plate, terne plate, etc.	13,391	5,924	63,140	138,311
Structural shapes, plain material	10,131	7,359	83,327	84,754
Structural material, fabricated	8,471	4,170	74,481	69,373
Steel rails	17,557	7,789	190,693	225,402
Rail fastenings, switches, frogs, etc.	2,577	1,659	29,764	35,167
Boiler tubes, welded pipe and fittings	15,059	22,002	134,613	184,582
Cast iron pipe and fittings	1,810	2,453	39,879	24,244
Plain wire	8,341	2,591	69,688	61,253
Barbed wire and woven wire fencing	6,772	7,426	65,519	59,556
Wire cloth and screening	78	245	1,345	1,877
Wire rope	523	321	4,709	3,903
Wire nails	3,463	878	25,516	44,701
All other nails and tacks	1,210	817	7,004	6,702
Horseshoes	40	58	880	812
Bolts, nuts, rivets and washers, except track	1,672	1,455	15,371	14,800
Car wheels and axles	1,169	1,543	13,606	17,322
Iron castings	751	682	8,544	8,115
Steel castings	431	534	1,816	4,946
Forgings	495	152	2,093	1,993
Total	177,471	131,276	1,441,757	1,691,437

*Separately reported since January, 1923.

Monthly Exports, January, 1923, to April, 1924, Inclusive

(In Gross Tons)

	All Iron and Steel	Pig Iron	Semi-Finished Material
*Average, 1912 to 1914	2,406,218	221,582	145,720
*Average, 1915 to 1918	5,295,333	438,462	1,468,026
Calendar year 1919	4,239,837	309,682	258,907
Fiscal year 1920	4,212,732	248,126	288,766
Calendar year 1920	4,961,851	217,958	216,873
Fiscal year 1921	4,168,619	129,541	82,549
Calendar year 1921	2,213,042	28,305	10,363
Fiscal year 1922	1,721,418	28,330	63,127
Calendar year 1922	1,986,297	30,922	107,201
January, 1923	123,190	2,482	12,253
February	133,902	2,786	9,357
March	163,920	2,881	14,066
April	177,471	1,844	14,863
May	203,389	1,848	16,859
June	171,183	2,960	12,278
Fiscal year 1923	1,816,329	31,891	137,757
July	163,553	2,966	8,357
August	161,426	3,117	11,232
September	172,499	2,148	12,610
October	152,511	2,294	13,442
November	186,956	3,198	16,347
December	177,344	2,759	11,073
Calendar year 1923	1,992,595	32,318	152,748
January, 1924	247,942	3,812	8,594
February	164,820	4,772	11,463
March	123,618	4,047	2,278
April	131,276	4,117	8,275
Ten months	1,691,437	34,222	103,671

*Calendar years.

in iron and steel plates, 6700 tons in galvanized sheets, 5000 tons in black steel sheets, 7500 tons in tin plate, 7100 tons in structural material, plain and fabricated; 9800 tons in rails, and 5750 tons in plain wire.

Principal among the gains in the ten months to which is attributable the increase of 250,000 tons of exports within that period are scrap, 52,000 tons; bars and wire rods, 17,000 tons each; steel sheets, 74,000 tons; tin plate, 75,000 tons; rails, 35,000 tons; boiler tubes, welded pipe and fittings, 50,000 tons; and wire nails, 19,000 tons. Decreases in most items were unimportant, although in the case of cast iron pipe the loss amounted to more than 15,000 tons, and in galvanized sheets to more than 10,000 tons. Shipments of ingots, blooms, billets, etc., decreased almost 22,000 tons.

Except for the preceding month, April exports were the lowest since February of last year. They amounted to only 80 per cent of the avorage month of 1923 and an even smaller percentage of the average of the preceding nine months of the current fiscal year.

National Pipe and Supplies Association

Speaker at Convention Says Grit and Nerve Are Needed More Than Anything—Low Prices Reported

THE fifteenth annual convention of the National Pipe and Supplies Association was held at the Hotel Cleveland, Cleveland, May 22 and 23. It started with an open session attended by jobbers and manufacturers, which was followed by morning and afternoon executive sessions for members and visiting jobbers.

At the first session several executives of companies that manufacture lines distributed by the members spoke briefly about the business situation and outlook. John J. Kennedy, National Tube Co., said that the volume of steel pipe business for the year compared favorably with the best previous year and, although admitting that talk is now pessimistic, he took an optimistic view of the future. Business men should get behind business and give it some momentum, he said. Walter E. Watson, Youngstown Sheet & Tube Co., also spoke on steel pipe and said that stocks are large, new enterprises not up to expectation and keen competition is getting in its work. He had heard of ridiculously low prices quoted by jobbers in many cities. What is needed now more than anything else, he said, is grit and nerve. F. C. Foster, Stockham Pipe & Fittings Co., Birmingham, Ala., speaking on the situation with respect to cast iron pipe and malleable fittings, said that jobbers are cautious and reducing stocks.

J. W. Oliver, first vice-president, Standard Sanitary Mfg. Co., stated that building permits and contracts during the first four months of this year in 27 Northeastern States doing 75 per cent of the construction work of the country amounted to $700,000,000, an increase of 30 per cent over last year. In his opinion, the only cloud on the horizon is Congress, which will soon adjourn.

Charles K. Foster, American Radiator Co., said that while the situation is spotty, the amount of construction is about the same as last year and the cost of building is about 5 to 6 per cent lower. He urged manufacturers and jobbers to devote more attention to broadening their markets by finding out ways to cause an increase in the consumption of their merchandise.

"An Approach to Some of the Problems of Distribution" was the subject of an address by Irving S. Paull, formerly chief of the Domestic Commerce Division, Department of Commerce. He urged manufacturers and distributors to study more closely the problems of distribution and pointed out the needs of economic efficiency in each section of the country. Business should know the point of greatest economy in distribution and the radius of economic distribution from every center, he declared. In some cases new economies in manufacturing are offset by the additional cost of distribution at too distant points. Business needs a commercial census, he declared. He referred to the trade association, the slogan of which is service, as the most potent agent in our economic life and emphasized the importance to industry of the Domestic Commerce Division, which he said may well become the laboratory to solve problems of industry. Some of the most constructive work in 50 years has been done by the Simplification Division, and he believes the Domestic Commerce Division can be made of as great value.

Among the speakers were Walter Gordon Merritt, who delivered an address on "The New Era of Industrial Relations." He spoke of the new industrial relations that he said are developing between employers and labor and attributed the improved relationship to cooperation between shop organizations and employees, the taking of employees into the business as stockholders under favored terms and of the better understanding on the part of employers of their duty toward employees.

Officers for the ensuing year were elected as follows: President, W. E. Clow, Jr., J. B. Clow & Sons, Chicago, reelected; first vice-president, M. W. Dennison, Braman, Dow Co., Boston, re-elected; second vice-president, W. C. Hanson, E. G. Schaeffer & Co., Washington; secretary and treasurer, George D. McIlvaine; executive committee, new members, Isidor Weil, Weil-McLain Co., Chicago; A. L. Taylor, McMann & Taylor & Co., New York, and H. W. Strong, Strong, Carlisle & Hammond Co., Cleveland.

Adopt Reduction in Tank Sizes

Action for the elimination of waste in the steel tank industry taken by Eastern manufacturers was reviewed and, with some modifications, adopted at a meeting of manufacturers, distributors and representatives of consumers held in the Drake Hotel, Chicago, last week, under the auspices of the Division of Simplified Practice, Department of Commerce. The groups of products considered were hot water, gasoline and fuel oil, cold water storage tanks, also hydro-pneumatic tanks for isolated water systems.

Fourteen sizes of hot water tanks were indorsed as the simplified line which will become effective Jan. 1, 1925, when acceptances have been received from 80 per cent of the interests concerned. The sizes are to be made in two working pressures. The first, 65 lb. per sq. in., will be classified as "standard," and the second, 100 lb. per sq. in. will be designated "extra heavy," and in each case the tanks will be stenciled with its class, the manufacturers' name and address. Thicknesses and other factors of safety, it was voted, are to be in accord with the American Society of Mechanical Engineers Code for "Non-Fired Pressure Vessels."

The capacities and sizes, diameters being inside diameter, and length meaning the length of sheet, adopted by the meeting were as follows:

Diameter, Inches	Length, Feet	Capacity, U. S. Gallons
20	5	82
24	5	118
24	6	141
30	6	220
30	8	294
36	6	318
36	8	423
42	7	504
42	8	576
42	10	720
42	14	1,008
48	10	940
48	16	1,504
48	20	1,880

The simplified sizes are to be made interchangeable for either horizontal or vertical installation.

In a statement to employees, President James A. Campbell of the Youngstown Sheet & Tube Co., Youngstown, calls attention to the McNary-Haugen bill, now before Congress, characterizing this measure so unsound fundamentally "that its enactment into law would be a serious matter."

New Norwegian Electric Pig Iron Furnace

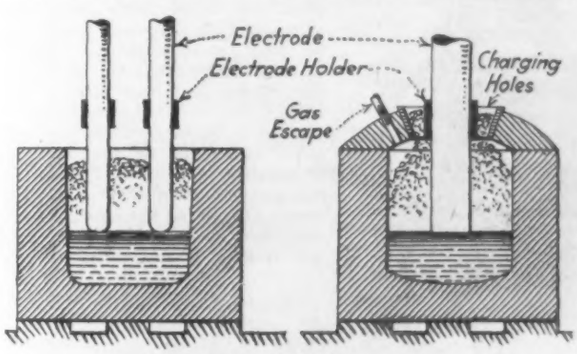
Open-Top Furnace Successfully Operating with Charcoal or Coke—A New Ore Reduction Process

BY FRANK HODSON AND DR. M. SEM*

NORWAY has ever been famous for the high quality and purity of its iron, but it was not until the year 1910 that it was produced commercially by electric furnace methods. The Tinfos Verk and Ulefos Jernverk installed simple monophase pit type electric smelting furnaces using coke as a reducing agent and produced between them about 10,000 tons of pig iron per year.

Details of the New Furnace

Originally these furnaces were provided with two sloping shafts, one on each side of the carbon electrode but these did not prove satisfactory and finally the gases generated were allowed to burn or escape. The furnaces were anything but efficiently operated in this way and little real progress was made until 1921, when the Norwegian Government decided to donate the necessary money for the running of an electric smelting furnace of 600 kva. capacity using the Soderberg self-baking electrode.



Section (Left) Through Open Pit and Section Through Closed Pit Type Furnace

The size of smelting furnaces is not limited as with the earlier monophase furnaces and they can be single, two or three-phase. The Norwegian Government decided that the Soderberg electrode opened up possibilities of a new field for electric smelting of iron ore. The furnace was put into operation in July, 1922, and ran continuously until Jan. 6, 1924. Mr. Tysland, formerly of the Tinfos Works was in charge of the operation and his preliminary report on the successful running of the furnace was made in Kristiania on Feb. 13, 1924.

There are places in the United States, Canada, South America and countries rich in cheap hydroelectric power where coal and coke is expensive and ore plentiful which are watching such experiments as this with keen interest. The plant of the Compania Electro Metallurgica Brasiliera already has two large electric smelting furnaces in operation, and over 120,000 kw. of electric iron smelting furnaces are now operating in various parts of the world. Chile could make better use of her abundant iron ore and water powers than by shipping raw ore to American smelters. It is just a matter of education plus enterprising capitalists with the money for necessary plant.

During the running of the Norwegian furnaces all kinds of ore was used, concentrates, sinters and lumpy ore. In some cases the content of powdery concentrates was up to two-thirds without giving special difficulty. Both charcoal and coke was used as a reducing agent; the charcoal worked so smoothly that it was decided to try to make conditions difficult for smelting so that coke and coke breeze was used most of the time. During the test 1300 tons of pig iron was produced, of which one-third was sold to foundries and two-thirds to a steel plant for use in open-hearth furnaces. There was no difficulty in making the iron either gray or white. The furnace was a pit type furnace with electrodes hanging vertically down into the furnace crater. The running was divided into three periods.

During the first period of test the furnace was run as an open pit furnace with one top Soderberg and one bottom electrode. The electrode was tried in various ways and most of the standard Norwegian ores were smelted to gray iron. The electrode was charged with about 11 amp. per sq. cm. In the second period of the test the furnace was still an open pit type but was provided with two top electrodes in series. During the third and most successful period of test the furnace was closed with a brick roof, provided with a charging shaft around the electrodes and the gases were collected by pipes. The consumption of power, coke and electrodes varied with the different kinds of ores, of the coke and the coke breeze respectively, and also with the grade and kind of iron made. A fairly good ore gave the following results: For each ton of pig iron 2600 kwhr., 380 kg. coke (of 85 per cent C) and 8 to 10 kg. of electrodes. It will be seen that these results compare very favorably to what is being done in the large electric shaft smelting furnaces and the operation and design of the new furnace is very much simplified.

A summary of the advantages claimed for this new furnace would include:

1. Cheaper operation—two workmen ran the trial furnace.
2. Cheaper and simpler installation—a 10,000 kw. furnace requires only three electrodes.
3. Any raw materials may be used (powdered ore, iron sands, coke breeze, etc.)
4. Load of the furnace can be varied as and when required.
5. Can use charcoal or coke economically.
6. Soderberg electrode operation continuous—no breakages, greater power input into furnace, increased production.

The first result of the experiment is the construction of a 4000-kw. 3-phase furnace of this system by the Company Christiania Spigerverk, Kristiania, Norway. The gases collected from the furnace will be used in an open-hearth furnace.

Mixing Ore with the Electrode

Readers will also be interested in a new process of ore reduction that is being developed in connection with the Soderberg idea. This new method is applicable to both ferrous and non-ferrous metallurgy and consists in making up the whole of the ore to be reduced in the form of composite Soderberg continuous electrodes. The ore is mixed with carbon in the form of pitch or tar and is made into continuous electrodes. Current is passed through these and the resistance of such electrodes to the passage of current drives off volatile gases which can be collected and reduces the ore to metallic form. In the case of iron ore, the first product in the lower zone of the electrode is a pure carbon free iron sponge, high in metallic iron. As the continuous electrode reaches the arcing zone of the furnace the iron sponge becomes pure molten iron with low carbon content. Practically all the heat put into the process is usefully employed and the actual heat generated in the electrode can be readily controlled and regulated. The process may have far-reaching effects on iron, zinc, aluminum, and other industries.

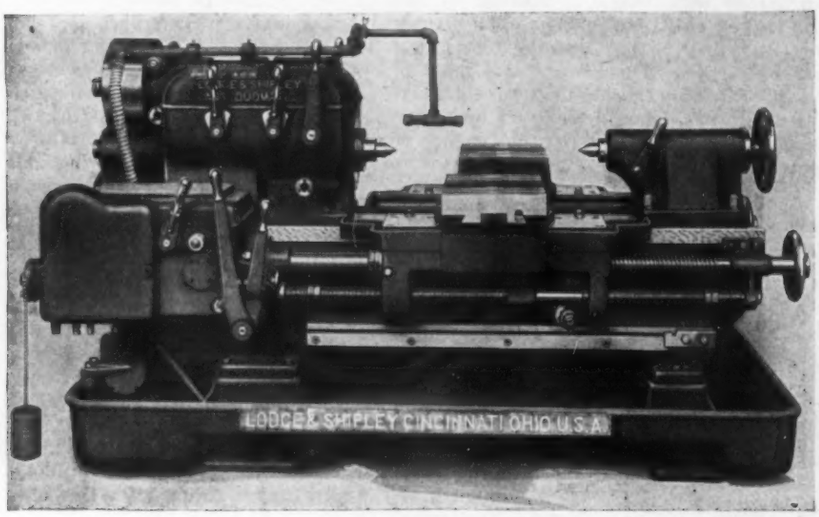
*President Electric Furnace Construction Co., Philadelphia and metallurgist Elektrokemesk Industre, Norway, respectively.

NEW AUTOMATIC LATHE

Both Carriages May Function Together or One Used to Turn and the Other to Face

An automatic lathe known as the Duomatic, which has been designed for the advantageous use of multiple tooling in turning and facing operations and is particularly adapted to the quantity production of lathe work held between centers, on an arbor, or in suitable holding fixtures, has been placed on the market by the Lodge & Shipley Machine Tool Co., Cincinnati. The machine is regarded by its designers as a forward step in machine tool development from the standpoint of providing sufficient power and stamina for the employment of multiple tooling to the limit of its possibilities.

The cycle of operation is completely automatic, including the locating of diameters and lengths on the work piece. The diameters and lengths are obtained by positive metal to metal stops, thus assuring a high degree of accuracy.



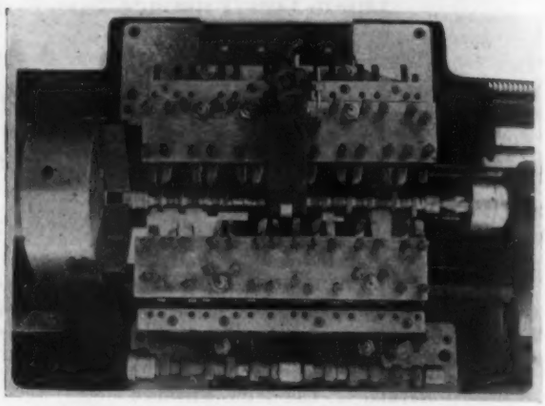
Automatic Lathe for Quantity Production of Work Held Between Centers, on an Arbor or in Suitable Fixtures. The machine has two complete carriages with tool slides. Both carriages may be used simultaneously in turning operations, or both tool slides in facing operations. One carriage may be utilized in turning, while the other is facing or fileting. The set-up for turning an automobile crankshaft is shown above, and the straight and taper turning of steering spindle is shown below

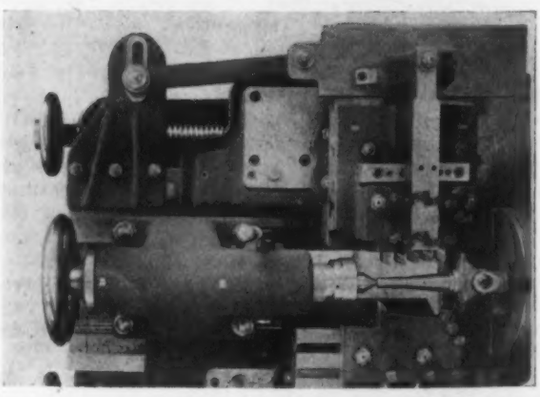
As its name implies, the machine is dual in character, having two complete carriages with tool slides, each equipped with an independent power quick forward and return traverse, as well as a power feed to both the carriage and the tool slide. Both carriages may be used simultaneously in turning operations, or both tool slides in facing operations, or, as more frequently required, one carriage with its tool slide may be utilized in a turning operation while the other carriage with its tool slide is performing a facing and filleting operation.

The dual characteristics, combined with the simple method of adjusting for the various functions, is intended to adapt the machine for a variety of work without the need for special attachments or parts. The rotation of the feed screw provides both the cross movement to the tool slide and the length movement to the carriage. An adjustable threaded micrometer sleeve arrests the movement of the cross slide and fixes the diameter; the adjustment of a pair of nuts on a threaded stop bar limits the movement of the carriage in either direction.

A single pulley equipped with a multiple-plate clutch transmits the power through alloy-steel gearing to the headstock spindle, which is of large diameter. The shafts carrying the gears are mounted in ball bearings. The heavy, deep bed, well supported carriages and massive tool slides are claimed to absorb the cutting strains and prevent vibration and chatter, which increases the life of the cutting tool, thus aiding production. Liberal use has been made of hardened alloy steel where such use provides more substantial construction. Extra large bearing surfaces on the carriages and tool slides are intended to assure long life and relative freedom from adjustment. All of the headstock and driving clutch mechanism, and the entire feed and power traverse mechanism is fully inclosed and automatically and continuously lubricated.

One of the accompanying illustrations shows the





set-up for machining an automobile crankshaft. In the set-up for turning a four-wheel brake steering spindle, it is to be noted that the straight and taper turning are done at the same time.

A bust of Admiral George Wallace Melville has been purchased by his friends for presentation to the American Society of Mechanical Engineers. Admiral Melville, who died in 1912, was engineer-in-chief of the U. S. Navy from 1887 to 1903. He was president of the American Society of Mechanical Engineers in 1899 and was an honorary member at the time of his death.

Loading of revenue freight for the week which ended on May 10 totaled 909,187 cars. This was a decrease of 4853 cars from the week before and a decrease of 65,554 cars from the corresponding week last year, but an increase of 142,093 cars over 1922.

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ESTABLISHED 1855

THE IRON AGE

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Steel in the Great War

IN his valuable history, "Industrial America in the World War," Grosvenor B. Clarkson, late director of the United States Council of National Defense, opens his chapter on "Steel: An Epic of the World War" with this paragraph:

The World War was moved and fought on steel. In its last days it was as much a Vulcanic struggle between the Mesabi and Lorraine, between the Ruhr and Pittsburgh, as it was a final grapple of men in Flanders, Champagne and the Argonne.

After relating at length, as reviewed in THE IRON AGE of Sept. 20, 1923, the record of the steel industry, Mr. Clarkson concludes as follows:

The relation of the Government to the steel industry, when fully realized, was perhaps the best example the war afforded of the masterly conception of industrial mobilization and functioning by the simple process of establishing effectual contact between a pooled and compactly united industry manned by its own captains and a Governmental organism, expert, initiative, resourceful and energetic. It was a model of that highest and best form of efficiency which President Wilson declared to be "the spontaneous cooperation of a free people."

In view of such testimony from an unprejudiced source as to the splendid part taken by steel in the Great War, it is unfortunate that a controversy has arisen in regard to some of the facts relating to price arrangements which preceded the close cooperation of the Government and the manufacturers. Mr. Baruch, in his statement objecting to parts of Judge Gary's address delivered at the American Iron and Steel Institute banquet last Friday night, shows what nobody has denied, that there were distinct differences of opinion in the early days of the war, and complains that Judge Gary is not definite enough in his facts and figures. But Mr. Baruch omits much himself that might be said. For example, he speaks of plates having been sold at as high as 14 cents, but he does not state the conditions of this wholly exceptional transaction made before there was any agreement as to prices. The buyers were Japanese shipbuilders who were willing to pay any price for steel to put into vessels which they were selling at fabulous profits.

Naturally, there were differences of opinion as to what the price basis should be, when it appeared in the summer of 1917 that our own Government would take up a large part of the output of American steel works. No one knew what costs would be, and costs varied widely. There were many uncertainties, particularly in respect to high-cost plants whose owners naturally wanted prices that would permit them to operate without a loss. Many conferences were held. There were grave doubts as to the constitutionality of any law that might be passed requiring steel producers to sell to the Allies or to the general public at the same prices charged to the Government.

Serious consideration was given in the summer of 1917 to the Pomerene bill which proposed to extend to the steel industry the provisions of the Lever act covering fuel and food. Finally agreement was reached between the steel manufacturers and the War Industries Board, and the results were magnificent. With the possible exception of one or two companies, manufacturers complied with every request of the Government, and the statements of Mr. Clarkson, Mr. Brookings and others in the inner circle as to how the war was won are conclusive evidence that the men of the steel industry did their full part.

Judge Gary made no reference in his address to one phase of the situation concerning which little or nothing has been published. That was the assurance President Wilson gave Mr. Baruch of his willingness to take over the steel industry if Mr. Baruch found in time that that was the only way in which the Government could secure a full supply of steel at prices which its representatives considered equitable. While it is not on record that Mr. Baruch acquainted the steel manufacturers with the large discretion the President had thus given him, the possibility of his calling upon the President in this way was in the minds of at least some of the negotiators in that critical time. In the review THE IRON AGE gave in its first issue of 1918, of the events leading up to the price agreement of Sept. 24, 1917, there was this guarded reference to the great power conferred on Mr. Baruch:

Measured by its effect on the future of the industry, the greatest development of the year was the fixing

of iron and steel prices by the Government. This was done, on the face of things, by agreement between a Government board and representatives of the steel manufacturers, but it is well known that had there been no agreement there would have been complete Government control either by a special act or under a construction of the war powers already granted the President.

Judge Gary is quite right in saying that wartime control of the steel industry by the Government would have been a calamity. There can be little doubt, moreover, that Mr. Baruch had no desire to adventure on such a dangerous undertaking. What it would have meant in reduction of steel output, in unreasonable increase in labor cost, in the jeopardizing of all the Government's plans for supplying ship and shell steel—plans on the success of which the whole campaign of the summer of 1918 turned—can only be thought of as a catastrophe which fairness, patience, patriotism and man-to-man understanding happily averted.

Business Forecasting

THE scarcity of good machinists, good carpenters and skillful men in other artisan lines is often deplored. The average machinist of today can produce a better piece of machinery than the machinist of a generation or two ago, but he has not so much individual skill. He is aided by improved appliances. It is the same in many lines of manual work.

How about business men? In many ways they have much greater facilities than their fathers or grandfathers. Are they doing correspondingly better work, or are they allowing the improvement in facilities to take the place of sound individual thinking?

Nowadays there is much statistical and economic information not formerly available. Various things are being charted and from the charts professionals in this line make forecasts as to what "business" is going to do. If business men take these ready-made opinions as their guide, instead of thinking for themselves as their predecessors did, they are much worse than is the machinist who does not possess the skill his father had, but produces better machinery, for the machinist holds his job and gets a great deal more money per week, while he works shorter hours and thus his percentage of profit, so to speak, is increased all the more. Is the business man getting better results in respect to product, economical production and percentage profits than his father or grandfather?

Many efforts at "scientific management" in the shop have run amuck because they failed to take account of the human element. What the workman was expected to do was not particularly complicated or difficult, yet he was indisposed to do it. The collective mind of business is a vastly more intricate matter. It is a great mixture rather than a clear composite, and it is neither to be controlled nor its conduct predicted by charts, however long a period of business cycles they cover.

The human element will always be the greater factor, and men vary. Predict to ten men that business will be "good" for six months. One man will take a chance on its being good for nine months. Perhaps two will decide to be on the safe side and prepare for trouble in four months. The other seven are more apt to watch each other for a cue. Every time one meets another he will ask, "How's business?", with the idea of acting accordingly.

When the war ended business men were all at sea as to the future. Their old reckonings did not help them. Some predictions had been made of several years of great activity and prosperity. Other predictions had been of a long depression, to "pay" for the war. After the Armistice, when things looked good, many thought the first prediction was right. When business turned downward they switched to the second. We have had more rapid and wider fluctuations in productive activity and in prices than would have occurred had there been no war, not on account of economics but on account of the human element. That element must be considered if business forecasting is to rise above the level of chart automatics.

Automobiles and Scrap

ACCORDING to presentations in the last two Annual Review Numbers of THE IRON AGE the automotive industry took 10 per cent of the steel produced in 1922 and 11 per cent in 1923. The percentages were deduced from direct returns of steel manufacturers, but some estimating had to be done at the source so that the human element was not entirely lacking. Consumption of steel by the automotive industry has been increasing more rapidly than steel consumption in general. This is true even though the number of automobiles produced from year to year is not the direct measure, since the average weight of automobiles has been decreasing. On the other hand the closed body is growing rapidly and it involves more steel than the open model. Ten per cent makes a fair working rule.

Few articles of steel pass through their life as quickly as does the automobile. The average of automobile life is increasing, according to careful studies made. If it is seven years now, it may be increasing at the moment by three months per year. On the other hand, automobiles have been growing cheaper and it becomes less of an operation to buy a new one. They are more used in business, where it pays to replace. One cannot count on the average life continuing to increase indefinitely.

There is, then, no serious danger involved in assuming that every year 10 per cent of the steel made seven years previous will become scrap. The steel is not lost, as it is in nails, fence, cans, etc., and it is not diminished in weight as in rails by wear. The automobile gives excellent promise of being a steady and important source of scrap supply.

One would reasonably suppose that by this time the industry of scrapping automobiles and producing therefrom good and trustworthy grades of scrap would have reached a high stage of efficiency and completeness. Such is notably not the case. Generally speaking, automobile scrap

is not in favor at the steel mills. It is, to say the least, very poorly prepared.

Many automobiles that are abandoned as to service do not reach the market at all. They can be seen in the country rusting away. That is not so much the fault of the automobile or of the owner as it is the fault of the market, which is not organized to be receptive. In the case of most of the automobiles that are dissembled as a regular commercial operation the chief incentive is that of getting the parts, the intrinsic value of the iron and steel being largely overlooked. The dissembler accumulates stocks of parts of various popular makes, for which he expects to find eventual sale. He has little capital tied up in such stocks, even though they may be extensive, for the cost of his raw material was negligible and the work is done at convenient times.

This is not as it should be. All that is necessary is to organize the industry. The supply of raw material is assured and there will always be a market if the scrap is properly prepared. If correct preparation were easy the thing of course would be done now. It is not impossible or difficult if proper methods are thought out and efficient appliances provided. It will not do to chop off as much of the spring as can easily be got into the shear and leave the rest on the axle housing, for instance, and use of the torch does not seem to be efficient. To get good merchantable scrap from an automobile at the lowest cost requires tools and appliances which must be designed for the particular work, just as innumerable tools have been devised for making automobiles.

After a German Settlement, What?

IT now looks as if the recommendations of the Dawes committee will be adopted by all of the parties in Europe and that Germany ere long will be put on the road toward rehabilitation and thus will be enabled to begin regular payments on reparation account. What are going to be the immediate economic results of this political settlement that is in prospect?

In the first place Germany must be financed, in which connection the United States must bear the brunt of the burden. It can do so and will want to.

With financial assistance and other arrangements the Germans will get to work. It is only out of their work that they can pay reparations. Everybody now understands that.

In order to work, the Germans will have to be supplied with a good deal of raw material. One of our own incentives to make a large loan to them will be the thought that it will be extensively expended in buying our copper, cotton, petroleum and other raw materials. Great Britain also will want to promote the rehabilitation of Germany in order to increase her own business, but what she has in view is not so much the sale of her raw materials as the sale of the work of her people.

But with Germany provided with supplies of raw materials and with her population inspired to work hard, which it will be constrained to do in order to support itself and at the same time create a surplus out of which to pay for reparation, what is going to become of the German manufactured products? What else can happen than selling them to the world at prices so favorable that the world must take them. We may exclude them to a greater or less extent from this country by means of our tariff, but we may lose correspondingly in our own export trade wherein we have no protection and are on a purely competitive basis. For example, while we are selling to Germany more copper in wire bars we may find that we are selling less copper to the rest of the world in the form of wire.

The greatest question in all of this is perhaps whether the new conditions are going to solve the problem of unemployed labor in Great Britain, where about 10 per cent of the workers are continuously idle and are supported by doles at the expense of the more well-to-do of the people. There is a grave question whether the British workman has not been so spoiled by that pernicious system that he is no longer disposed to work even if he has the opportunity.

As good an authority as Arthur W. Kiddy, editor of the *Bankers' Magazine*, London, in a recent communication to the New York *Evening Post* said:

> The fact is that our whole industrial system rests upon an uneconomic basis and that the position cannot possibly be adequately remedied so long as trade unions maintain their present tyranny, which is holding up governments and people alike to ransom. The hollowness of present unemployment, which involves millions of pounds annually in doles, is shown by the fact that it is impossible to obtain domestic labor at treble pre-war wages, or even to obtain casual labor for odd jobs. Similarly the famine in housing accommodations arises because of the tyrannous exactions of the trade unions concerning wages and conditions of labor.
>
> The situation would, of course, be temporarily relieved if peace were restored in Europe and international trade revived; but the trouble will only be postponed until Britain's industrial arrangements are completely overhauled and adjusted to modern conditions. It is no exaggeration to say that employers in many industries even dread a revival in trade, as they fear that the first indication of prosperity will occasion fresh strike movements.

We may have similar disconcerting thoughts with respect to ourselves, not only as to labor conditions but also as to agricultural. The same things that keep up our prices—the exclusion of imported goods, the unbalancing of domestic labor, etc.—operate adversely with respect to the farmers.

We are in no way decrying the approaching composition of affairs in Europe, which is indeed essential, but we are drawing attention to the improbability of its being a panacea for all existing economic evils. Even after it be consummated there will be many things to think about.

THE French iron and steel industry made a new record in March, with an output of 639,000 tons of pig iron and 573,000 tons of steel. The average for the first quarter of the year was roundly 50 per cent in excess of the 1913 or pre-war rate in both iron products. The free movement of fuel from the Ruhr is an important factor in the increase, but the significant thing is that France is

sending more steel to market than at any time in her history. At the same time Belgium and Luxemburg are turning out more steel than in prewar time. Thus, France, Belgium and Luxemburg are making up in part for the loss of production due to Germany's prostration, and at the same time there is keener competition among all steel-producing nations for the business of countries having no steel industry of their own.

CORRESPONDENCE

Properties of Metals Used for Aircraft

To the Editor: The article on "Metals Used in Airplane Construction," by Lieut. F. O. Carroll, of the Air Service, War Department, appearing as the leading feature in the THE IRON AGE of April 24, is interesting and valuable as a popular exposition of the developments in metal construction, and more of this sort of thing is needed to keep the public informed of the progress in this important field, provided the information is correct.

Unfortunately, some of Lieutenant Carroll's statements regarding the properties of metals used in aircraft are either incorrect or misleading, and are likely to give a wrong impression. Lieutenant Carroll states that duralumin is difficult to work except in the soft or annealed condition, and that this condition lasts only a few hours. The fact is that, if desired, duralumin can be annealed so that the soft condition remains indefinitely, until the metal is hardened by suitable heat treatment or severe cold working. He repeats the old fallacy that duralumin is not affected by salt water, whereas it is really very severely attacked and quickly ruined by exposure to moisture, especially salt water, unless given a protective coating.

He states that nickel steel used in aircraft is not a good metal for welding. Careful investigations, reported in THE IRON AGE, Sept. 27, 1923, showed that of three commercial types of alloy sheet steel, nickel steel gave the best results in welding, and experience has shown that excellent results can be obtained in production. Moreover, this steel may and should be heat-treated after brazing or welding, and will then give a tensile strength of 125,000 lb. per sq. in. or higher.

Lieutenant Carroll states that "any metal structure which is subjected to repeated alternate stresses will in time fail," and that the metal parts of aircraft are subject to such vibrating action, which will cause them to "crystallize" and perhaps break at any moment. This paints a horrible picture, which, fortunately for aircraft and for other structures essential to modern industry and civilization, is not true. Fatigue failures in aircraft are quite rare, and are caused by some defect of design or of material which should and can be avoided. Vibration does not cause metals to "crystallize"; that is an exploded theory.

I offer these comments, not in a spirit of criticism, but for the sake of public confidence in aircraft.

H. C. KNERR,
Metallurgist, Naval Aircraft Factory
Philadelphia, May 20.

New Commissioner Presumably Opposed to Pittsburgh Basing

WASHINGTON, May 27.—Appointment by President Coolidge of Charles W. Hunt, head of the Iowa Farm Bureau, as a member of the Federal Trade Commission to fill the vacancy caused by the resignation of Victor Murdock, has created particular interest, as it relates to the action of the commission in the Pittsburgh plus case. The commission is known to be divided on the issue. It is reported that two members are in favor of issuing a cease and desist order against the practice of quoting steel prices on a Pittsburgh base, while the other two members are said to favor dismissing the case. The general belief is that Mr. Hunt, being associated with farm interests, will cast his vote with those in favor of a cease and desist order. Should this prove to be the case, the order would be issued by a majority of one vote, assuming that two of the present members will vote for such an order.

Mechanical Engineers Vote to Increase Annual Dues

CLEVELAND, May 27.—Members of the American Society of Mechanical Engineers voted themselves an increase of annual dues of from $15 to $20. The canvass of a referendum vote, closed just prior to the spring meeting now in session here, showed 4039 in favor out of 7602 voting. Attendance is large. Milwaukee was selected for the meeting in May next year.

The Iron Age and Its Readers

IT is said now and again that there are too many conventions of manufacturers and other business men. No doubt the demands in time and in dues seem at times heavily burdensome. But there are associations with such records of tangible benefit to their members, through their high accomplishments, that their discontinuance is well nigh unthinkable.

It has come about that the convention of these indispensable associations produce comment on various aspects of modern business problems that represents the best thinking in the particular trade or industry. The manufacturer who for most of the year is working out his own salvation, and is generally silent while he works, becomes articulate at convention time. While ordinarily leaving to the editor of his business paper the expression of opinions on what is going on in his industry, at these meeting times he turns editor himself, commenting out of the fullness of his experience on developments which every progressive man in the business must be ready to deal with.

Since only a portion of the men in any industry get to its conventions, what is said and done must be carried to the others by the next issue of their weekly business paper. With its long record of convention reporting, THE IRON AGE has come to be looked to in the metal-working inddustries for adequate accounts of these important meetings. Mere mention reports or reports written from an advance program will not answer. The best thought of the best brains in an industry deserves to be presented in a way befitting the pains these leaders have taken to give others the choice fruit of their experience.

BOOK REVIEWS

The Anthracite Question, by Hilmar S. Raushenbush. Pages xii + 165, 5 x 7½ in. Published by H. W. Wilson Co., 960 University Avenue, New York. Price, $1.50.

This book claims to analyze the divergent problems of the operators, the miners, and the public in the anthracite industry, based supposedly on the reports of the United States Coal Commission, not with the idea of presenting solution, but rather "to gather certain facts about the industry into their significant connection."

Here, indeed, is a great opportunity—to set forth the essential facts of the anthracite question, as especially developed through the Coal Commission reports, so that the man in the street could understand the basic problems involved. A clear, cold, matter-of-fact presentation of facts, through such a book, might go far in educating public opinion and in promoting understanding of one of America's great industrial problems.

After only a few minutes' reading, however, the careful reader—economist, statistician, industrialist, or student of anthracite conditions—turns from the book with the feeling of intense dissatisfaction. The method of approach, the presentation of argument, the use of statistical material are biased and colored with the labor point of view. Extravagant statements are made without recourse to facts. For example, in speaking of the separation of the coal and railroad companies for the purpose of breaking up monopoly control, Mr. Raushenbush says "(the monopoly) may go on, in fact, long after it has been legally dissolved. This was the country's experience with the Standard Oil dissolution, and the earlier dissolution suits in the anthracite industry." The miner's side, as shown before the Coal Commission, is presented without reference to the data submitted by the operators or to the findings of the commission itself.

The anthracite industry, under practically 100 per cent closed shop conditions, increasing wages, and working year of 270 days, has been one of the better paid and more stable industries of the country. The Coal Commission devotes several reports to a minute analysis of employment, hours, wage rates and earnings which show the comparatively favorable position of the wage earner. Nevertheless, the author of this book consistently refuses to make a comparison of anthracite wages with scales in other industries, which in 1922 meant "the unorganized steel industry and the somewhat foolishly arbitrated railroad industry." Wages should be increased because of the "ability of the industry to pay."

Eliminating the partial methods of presentation, there are some portions of the book that are most interesting. The analysis of proposed solutions through dissolution suits, publicity, pooling or price fixing, nationalization and consumers' ownership are illuminating. Especially pertinent are the discussions covering the results of the present practical monopoly, the advantages and disadvantages of complete monopoly, the proposed superpower plan, and the recommendations of the Coal Commission. For a clear, neutral picture of the conditions surrounding the anthracite industry, however, other sources should be consulted.

CHARLES M. MILLS.

Against Metric Compulsion

In a 64-page pamphlet the American Institute of Weights and Measures, 115 Broadway, New York, presents an array of reasons why we should keep "Our American System of Weights and Measures," as the pamphlet is entitled. Attention is called to the fact that, even in those countries which nominally are under the compulsory use of the metric system, it has been found impossible to change the ingrained habits of the population, with the result that the metric system is used side by side with the system commonly known as the English, and with further complications in the shape of old systems of more or less local usage persisting in spite of Governmental intolerance.

A chart of 1919 world export trade shows that its distribution may be represented by 48.2 per cent from the 12 countries where the English system predominates, 37.5 per cent from 37 countries where the metric system predominates, and 14.3 per cent from 28 countries of miscellaneous measures, where neither the English nor the metric system predominates.

It is pointed out that since 1866 the metric system has been a legal measure throughout the United States and that, in spite of continuous efforts by its partisans to push it, American manufacturers have not found it useful except in a few instances and in a relatively small way. A poll of the Association of American Steel Manufacturers in 1920 showed 96.3 per cent opposed to compulsory metric legislation. The American Railway Association has taken the same stand. The same is true of the National Automobile Chamber of Commerce, the National Metal Trades Association, the lumber industry of the United States in cooperation with the Department of Commerce, Division of Simplified Practice, the American Institute of Architects, the National Board of Fire Underwriters, the textile industry as represented by a large number of associations, the Retail Dry Goods Association of New York, the Rubber Association of America and numerous other organizations.

The War Department at Washington, under a general order in 1920, specified that "hereafter the customary British units of weight and measure (including the degree Fahrenheit) will be used throughout the Army." The Navy Department has taken the same stand.

New Books Received

Crain's Market Data Book and Directory of Class, Trade and Technical Publications. Pages 505, 6¼ x 9¼ in., illustrated. Published by G. D. Crain, Jr., 537 South Dearborn Street, Chicago. Price, $5.

English Industries of the Middle Ages. By L. F. Salzman. Pages 360, 5¼ x 7¾ in., illustrated. Published by Oxford University Press, 35 West Thirty-second Street, New York. Price, $3.50.

Making Letters Talk Business. Prepared by Sherman Perry. Pages 184, 6 x 9¼ in. Published by the American Rolling Mill Co., Middletown, Ohio. Price, $1.25.

Mineral Resources of the United States, 1921. Two volumes. By G. J. Loughlin. Vol. I, Metals, pages 617; Vol. II, Non-Metals, pages 682, 6 x 9¼ in. Published by the Government Printing Office, Washington.

Untersuchungen zur Klärung der Frage der Elektrischen Verhüttung Schweizerischer Eisenerze. By Von R. Durrer. Pages 48, 7½ x 11 in. Published by Verlag Stahleisen m.b.H., Düsseldorf, and obtainable from Paul F. Hermann, 501 Century Building, Pittsburgh.

Anhaltszahlen für den Energieverbrauch in Eisenhüttenwerken. By Heat Economy Bureau of German Iron and Steel Institute. Pages 74, 7½ x 11 in., several charts. Obtainable from Paul F. Hermann, 501 Century Building, Pittsburgh, Pa. Price, $1.75.

Popular Research Narratives. Collected by the Engineering Foundation. Pages 152, 5 x 7½ in. Published by Williams & Wilkins Co., Baltimore, Md.

The second edition of Dr. Bernhard Osann's booklet entitled, "Leitfaden fur Giessereilaboratorien," has recently been offered from the press of Julius Springer, Berlin. It is a familiar German publication, giving the latest and revised methods for analyzing various raw and other materials involved in the operation of an iron foundry.

European Steel Markets Are Marking Time

British Business Volume Poor and Pig Iron Yielding— German Steel Prices Lower—Many Plants Closing— French Fear for Coke Supplies

(*By Cable*)

LONDON, ENGLAND, May 27.

PIG iron is weaker on a general reluctance of domestic and export consumers to purchase for forward requirements and some makers now are anxious for fresh orders. The Continent is endeavoring to compete more freely. Hematite is quieter on renewed competition and makers are inclined to shade prices for suitable parcels.

Foreign ore is more active. Spanish spathic ore is being sold at 20s. ($4.34) and good Bilbao Rubio is done at 23s. to 23s. 6d. ($5 to $5.10) c.i.f. Tees.

Demand for finished iron and steel is improving, but the volume of business still is poor, particularly for export. Domestic trade inquiry is broadening for small parcels, but substantial tonnages are not yet involved generally.

Continental position is difficult to gage. Makers generally are reluctant sellers, owing to the German fuel position, and are asking higher prices, but consumers are disinclined to meet them and business practically is confined to merchant dealings.

In Germany the Krupp plants are curtailing operations drastically. The Gewerkschaft August Thyssen-Hütte has shut down furnaces at Hamborn and Brückhausen, employing 1300 men, also the Dinslaken plants, employing 4000. The Mulheim plants may close in a few days. Phoenix Aktien Gesellschaft at Horde has discharged its 12,000 employees and the Dortmunder Union also is closing completely. The Bochumer Verein and Gutehoffnungshütte are contemplating an entire shutdown.

French authorities are taking steps to insure the maintenance of the flow of coke supplies to France, which latterly have dwindled. They have commandeered surface fuel stocks.

Tin plate demand has improved at the minimum 23s. 6d. ($5.10) basis IC, f.o.b., purchasers realizing that no further fall is likely yet. There is keen demand for 28 x 20's, both primes and wasters. There are some Canadian inquiries among the export demand. The domestic trade is more active, odd sizes being done at 23s. 6d. basis IC, f.o.b.

Galvanized sheets of 24-gage in corrugated bundles have advanced to £17 5s. (3.34c. per lb.), resulting in a rush of merchant covering and fair buying for Indian account. The market is showing more signs of stability.

There is further reduction in Japanese specifications for 30-gage black sheets on American competition. Japan 6 x 3, 13's, 107 lb. now are £17 15s. (3.44c. per lb.) for ordinaries and £18 (3.49c. per lb.) for specials, both f.o.b.

BUYING ALMOST STAGNANT

Except in Certain Specialties, British Market Is Marking Time—Big Excavator Contract

LONDON, ENGLAND, May 15.—There is little interesting about the iron and steel trades. Demand for pig iron is maintained, but not at such a heavy rate as was the case some weeks back, and consumers at home have supplies to come to them before it will necessitate any further buying. Export markets have been inquiring, particularly France and Germany, and some good sales have been made, but the position as a whole is by no means stable. Stocks of most Cleveland grades are low, it is true, but there is little inclination on the part of makers to reduce prices to sufficiently attractive levels; indeed, with the cost of production so uncertain, there is already talk of higher prices in the near future. Cleveland pig iron today is about 92s. ($20.06) for No. 3 G. M. B., a figure which competes very favorably with Continental grades.

Finished Material Quiet

Purchasing of finished iron and steel has ruled very quiet during the past two weeks and, in fact, in many

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.34 per £1, as follows:

Durham coke, delivered	£1	7½s.	to £1	8s.	$5.97	to	$6.08
Bilbao Rubio ore†	1	4			5.21		
Cleveland No. 1 foundry	4	16			20.83		
Cleveland No. 3 foundry	4	11	to 4	11½	19.75	to	19.86
Cleveland No. 4 foundry	4	10			19.53		
Cleveland No. 4 forge	4	9			19.31		
Cleveland basic	4	12			19.97		
East Coast mixed	4	18½			21.37		
East Coast hematite	4	19	to 5	0	21.48	to	21.70
Ferromanganese	17	0			73.78		
Rails, 60 lb. and up	8	10	to 9	10	36.89	to	41.23
Billets	8	0	to 8	5	34.72	to	35.81
Sheet and tin plate bars, Welsh	8	18¾			38.79		
Tin plates, base box	1	3½			5.10		
					C. per Lb.		
Ship plates	9	5	to 9	15	1.79	to	1.89
Boiler plates	13	0	to 13	10	2.52	to	2.62
Tees	9	10	to 10	0	1.84	to	1.94
Channels	8	15	to 9	5	1.70	to	1.79
Beams	8	10	to 9	0	1.65	to	1.74
Round bars, ¾ to 3 in.	10	0	to 10	10	1.94	to	2.04
Galvanized sheets, 24 g.	17	5			3.34		
Black sheets, 24 gage	12	10	to 13	0	2.42	to	2.52
Black sheets, Japanese specifications	15	5			2.96		
Steel hoops	12	10	& 12	15*	2.42	&	2.47*
Cold rolled steel strip, 20 gage	17	2½			3.32		

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(*Nominal*)

Foundry pig iron:							
Belgium	£4	5s.			$18.45		
France	4	5			18.45		
Luxemburg	4	5			18.45		
Billets:							
Belgium	6	2½			26.59		
France	6	2½			26.59		
					C. per Lb.		
Merchant bars:							
Belgium	6	17½	to £7	0s.	1.33	to	1.36
Luxemburg	6	17½	to 7	0	1.33	to	1.36
France	6	17½	to 7	0	1.33	to	1.36
Joists (beams):							
Belgium	6	17½	to 7	0	1.33	to	1.36
Luxemburg	6	17½	to 7	0	1.33	to	1.36
France	6	17½	to 7	0	1.33	to	1.36
Angles:							
Belgium	8	0	to 8	5	1.55	to	1.60
⅛-in. plates:							
Belgium	8	2½			1.58		
Germany	8	2½			1.58		
¼-in. plates:							
Luxemburg	8	2½			1.58		
Belgium	8	2½			1.58		

cases has fallen right off. The chief reason for this, of course, is that consumers abroad are looking for lower prices and for some time past have withheld placing orders, while at home there is little demand except for certain specialties. Makers on the Northeast coast are fairly well filled with orders for plates and there is great difficulty in getting certain sizes and certain thin sheet specifications.

It is rather curious that at the same time plates and sheets on the Continent are scarce also, but this doubtless is due to the heavy buying some weeks back, when the Continent found it cheaper to buy here, owing to the sudden rise in the franc. But there still is no life about the ordinary merchant business. India, China and other large overseas buyers take but little interest except to send over buying limits which, in most cases, neither makers here nor on the Continent can look at.

During the week a new graving dock erected for Palmers (Swansea) Dry Dock Co., was opened at Swansea, Wales. It was stated at the opening ceremony by the president that plans had been provided for the construction of another dock alongside of it, if necessary.

Ruston & Hornsby, Lincoln, England, have been awarded contracts for six 250-ton dragline excavators for the Indian Government. This contract is stated to have been the biggest one of its kind ever placed.

GERMAN STEEL PRICES FALLING

Both Ingots and Bars Lower Than They Were a Month Ago—Market Weakening

(*By Radiogram*)

BERLIN, GERMANY, May 26.—Steel ingots now are held at 112 gold marks per metric ton ($27.10 per gross ton) and steel bars at 137 marks (1.48c. per lb.). The market is weakening.

[Ingots at the latest quoted date, April 18, were priced at 125 marks ($30.25). Steel bars reached 160 marks (1.73c. per lb.) on that date, but by April 30 had reacted to 150 to 155 marks (1.62 to 1.67c. per lb.)]

IRON MAKING REDUCED

Only One-third of Blast Furnaces at Youngstown Operating—Sheet Mills Started

YOUNGSTOWN, May 27.—In the Mahoning Valley, rolling mill schedules of iron and steel properties continue to hold their own, but blast furnace production is on a declining basis. Of 45 stacks in the Youngstown district, embracing the Mahoning and Shenango Valleys, but 15 are now active, representing about 40 per cent of the gross capacity. The Carnegie Steel Co. has suspended a stack in its New Castle, Pa., group, accounting for the loss of another furnace this week.

Steel-making likewise is dragging bottom in both open-hearth and Bessemer departments. Of 51 independent open hearths, 21 are melting this week, while the Carnegie company is operating 15 of 30 steel units in the Ohio Works complement. The Youngstown Sheet & Tube Co. has suspended its Bessemer department, following a brief resumption; the Carnegie company is operating its Bessemer plant at 60 per cent, and the Republic Iron & Steel Co. its Bessemer department at a retarded rate.

Following an idleness of four weeks, the 12-in. bar mill of the Sheet & Tube company resumed Monday to work off an accumulation of orders involving 1800 tons. Records indicate this mill has averaged about 50 per cent operations over a six-year period.

Except for continuous operating departments, the steel industry in the district will generally suspend Thursday evening this week, in observance of Memorial Day, and will not resume until the following Sunday midnight shifts.

Rolling Mill Operations

Of 120 sheet and jobbing mills, 72 are scheduled, the same as the week before. This is a distinct gain, however, as compared with the recent low point, when active mills dropped to 53. The Waddell Steel Co., Niles, started four mills Monday, operating for the first time in four weeks. The Sheet & Tube and Trumbull Steel companies added to their active sheet mills, but the schedule is held down by reason of the suspension of the entire group of mills of the Sharon Steel Hoop Co., comprising nine mills.

The Trumbull company has enlarged its tin mill schedule, owing to an increase in specifications against existing contracts. This company is operatnig its three strip mills at 80 per cent.

The Republic company is operating three light bar mills in this territory and its 14-16 in. bar mill at the Brown-Bonnell works. The Carnegie company is maintaining its 17 bar mills, divided among the Upper and Lower Union mills and McDonald plant, at 60 per cent.

But one plate mill is being maintained in this district on the active list, the 84-in. mill at the Brier Hill works of the Sheet & Tube company. Skelp mill averages show a loss, due to complete suspension by the A. M. Byers Co., Pittsburgh, of one unit at its Girard plant, and operation of the other mill three days per week. The Sheet & Tube company is operating three skelp mills and the Republic company one.

Tube mill averages are unchanged, with 12 of 17 mills rolling.

MINERS' WAGES REDUCED

Schedules of Independent Companies Being Adjusted in Connellsville Region

PITTSBURGH, May 27.—Several of the larger independent operators in the Connellsville district in the past few days have followed the wage reductions inaugurated by the smaller producers several weeks ago, and with the exception of the H. C. Frick Coke Co., a subsidiary of the United States Steel Corporation, which is still paying the 1922 scale, the district is now back, or will be in the next few days, to the Nov. 10, 1917, scale. That scale called for a rate of $2.29 per 100 bushels (7600 lb.) for mining and loading room and rib coal as against $3.24 in the 1920 scale; $5 and $5.05 per day for drivers, rope riders, etc., against $7.50 and $7.55 in the recent scale and $3.30 per day for mine laborers as compared with $6.55 in the 1922 scale. The common labor rate, however, will hardly drop to the 1917 rates. The reduction averages about 33 1/3 per cent and its application thus far has been attended by no more than minor disturbance among the men.

Connellsville miners and coke oven workmen had seen the results, as far as steady work was concerned, in the union districts at the old scale, and as a matter of fact they had been expecting lower wages for some time. Peaceful acceptance of the cut also may be ascribed to the fact that work paying as well as mining and coke making is not readily obtainable.

There is an impression that the Frick company will not immediately follow the wage reduction, although there are reports of a move by this company by July 1. Delay by this company in reducing wages is attributed to the fact that, as the company of which it is a part is likely to show substantial earnings for the present quarter, it might not be politic to cut; and then there is Judge Gary's statement at the American Iron & Steel Institute meeting last week in support of the maintenance of present wages. Those who expect the Frick company to meet the independent reduction, however, assert that Judge Gary's remarks referred to iron and steel plant labor, and not to its coal mines and coke plants, where wage scales have advanced materially more than those in the steel plants.

MANY SHEET ORDERS

Aggregate Tonnage Is Not Large—Wage Conference at Atlantic City

YOUNGSTOWN, May 27.—In the sheet steel industry, which predominated in finished lines in the Mahoning Valley, orders continue numerous, but involve small lot tonnages. In fact, it is sometimes difficult to make up schedules a week in advance. Makers are now obtaining an average price of $3.60 per 100 lb. on No. 28 gage black sheets, with proportionate differential on other grades.

Some distress lots have moved at $3.50, but the tonnage involved is comparatively small. Only the smaller interests have receded to the current minimum quotation in order to fill gaps in rolling schedules.

District interests will be represented this week at the annual wage conference, which opens in Atlantic City with the Amalgamated Association of Iron, Steel and Tin Workers. James H. Nutt, of Youngstown, secretary of the Western Sheet and Tin Plate Manufacturers' Association and the Western Bar Iron Association, has gone to Atlantic City for the conference.

Among the interests in this territory subscribing to the Amalgamated Association's sliding scale wage agreement are the Republic Iron & Steel Co., Newton Steel Co., Trumbull Steel Co., Sharon Steel Hoop Co., Falcon Steel Co., Thomas Sheet Steel Co., and the Waddell Steel Co. The Youngstown Sheet & Tube Co., which has always been open shop, has not interfered with the agreement governing its Brier Hill properties, since their absorption by the former company. The management has indicated there would be no interference so long as the Amalgamated Association continued a conservative policy, such as has marked its management during the past few years.

There has been some sheet buying on the part of manufacturing consumers whose stocks have been reduced, against a possible suspension of the independent mills June 30 through failure to renew the wage contract.

While the semi-finished steel price to non-integrated sheet rollers in this district is now on a flat $40 per ton basis, for sheet bars particularly, the price to occasional buyers is at least $1 per ton higher. Specifications against contracts are for small tonnages, and all semi-finished makers can furnish prompt delivery. In the Mahoning Valley, 30 open-hearth furnaces are cold and are ready to operate as soon as orders are received.

One Valley interest reports a substantial increase the past ten days in the specifications for tin plate, and its schedules are enlarged in consequence.

Plea for Standardization in Structural Steel

Taking wastes in steel construction for his theme, Lee H. Miller of Cleveland, representing the American Institute of Steel Construction, urged the standardization of building materials in an address to 150 engineers and architects of the Southwest, assembled in Kansas City, May 21. Those present were guests of the Kansas City Structural Steel Co., whose president, Howard A. Fitch, presided.

Among the evils resultant from the existing system, with its numerous building codes, Mr. Miller pointed out that mills have never developed the structural steel business because they were not interested in where the steel went. He sought to demonstrate by use of charts how the new specifications advocated by the institute would make for an increase in unit stress of 2000 lb. per sq. in. and a decrease in the number of rivets required. "The present system," he stated, "is costing the American people needless millions each year because of lack of standardization." The automotive industry was cited as an example of what may be done by uniform practice to reduce waste and, hence, the final consumer cost.

Charles F. Abbott, New York, executive director of the institute, explained the purpose of the organization, stating that it is national in character, represents about 140 leading fabricators, or 72 per cent of the total plant capacity of the country, and that it is a non-profit organization. "Its purpose," he said, "is solely to effect economies in the fabrication and erection of structural steel in order that the industry may contribute its part in the reduction of building costs. Our work is strictly educational; our meetings are open to the public. We never discuss prices."

The institute is now publishing standard specifications, prepared by five leading authorities who are not connected with the steel industry. Mr. Abbott expressed the hope that these specifications would be adopted as part of all city codes, as already has been done in several large cities. It was emphasized that the institute does not advocate a sameness in buildings, nor impairment of the worth of buildings; but rather it seeks to obtain a uniformity in the materials that go into the building in an effort to reduce structural steel costs, which constitute about one-fifth of the total building cost.

Trolley with Ball Bearing Pressed Steel Wheels

A new trolley, the distinctive feature of which is that it has ball bearing pressed steel wheels, has been brought out by the Chisholm - Moore Mfg. Co., Cleveland. The bearings are built in the wheel during its manufacture, so that the wheel and its bearings form a complete unit. The wheel is 3 in. in diameter and has a 13/16 in. tread.

The side frame is of steel and has an oscillating feature in order to distribute the load on all four wheels and thus assure positive traction. By the shifting of washers the trolley may be used for 4 to 7 in. I-beams and by the use of special separators it can be operated on larger beams. A hoist with swivel connection when hung from this trolly can swing a complete circle. When an I-beam is closed at both ends the trolley may be installed quickly by removing the equalizing pin shown in the lower part, thus separating the two side frames.

It will be noted that the trolley is simple in construction and convenient to install. It weighs only 17½ lb. complete. It is made at present in one size to handle loads up to 1 ton.

British Steel Exports and Imports Expanded in April

WASHINGTON, May 27.—Iron and steel exports from Great Britain during April totaled 336,799 gross tons, a gain of 17 per cent over exports during March, according to a cable received by the Department of Commerce from Commercial Attaché Walter S. Tower, London. Imports into Great Britain during April aggregated 198,902 tons, an increase of 20 per cent over those during March and the highest total of any month this year.

The heaviest increases in exports were in pig iron, ferroalloys, railroad material other than rails, steel bars, rods, angles, and galvanized sheets. Exports of plates, sheets, rails, wrought tubes, and pipe and fittings dropped off considerably. Growth in imports was accounted for by large receipts of pig iron, ingots, blooms, billets, and slabs.

During the first four months of 1924, exports of iron and steel from Great Britain amounted to 1,293,198 tons, and imports were 696,078 tons.

Iron and Steel Markets

OUTPUT STILL FALLING

Market Nearer a Stand in Prices and Production

Wage Maintenance Policy at Steel Plants, but Coke Workers Are Reduced

The month just ending has seen an uninterrupted decline in the rate of steel production and in the volume of new business going to the mills. In the past week, as in the week preceding, the falling off in output and in orders was much less pronounced than in the first half of the month; at the same time there is a lessening expectation of an early change in conditions.

The number of important producers of steel operating on a 50 per cent basis is larger this week, and steel ingot production for May will be further reduced by general shut-downs for the May 30 holiday and on Saturday following.

There is more general recognition of a downward trend in steel consumption that has been obscured thus far by the rapid readjustments at the mills. But shipments to consumers in March and April were at a notably high rate without causing undue accumulations in second-hands, so that the continuance of production at close to the present rate seems better assured.

The announced policy of the leading interest in maintaining wages and the expressions from independent companies to the same effect are construed as favorable to the holding of prices at not far from today's level. Yet uncertainty as to prices is plainly limiting new buying, and the few changes of the past week have been downward.

The extreme concessions made on any unusual business is seen in the taking of the 3500 tons of plates for 100 locomotives to be built at Richmond, Va., at less than a 1.90c., Pittsburgh, basis. The order went to the Central West. In the East some plates have gone at 2c., though Pittsburgh district mills commonly hold to 2.15c.

The Chesapeake & Ohio Railroad is inquiring for 11,000 tons of plates, shapes and bars for 1000 freight cars to be built for that road by the Newport News Shipbuilding & Dry Dock Co. Material for several thousand other cars ordered by the C. & O. was bought direct by the car builders from Chicago mills.

Structural steel awards have shown a marked falling off, the week's total being about 15,000 tons, while new work also amounts to 15,000 tons.

Sheet mill operations in May have averaged slightly over 50 per cent, and independent companies have done rather better in output than the Steel Corporation in the past two weeks.

A company having merchant blast furnaces in western Pennsylvania and on the Lake front reports sales of various grades of pig iron amounting to 90,000 tons; otherwise pig iron in nearly all centers is extremely quiet with a tendency toward lower prices. Southern Ohio iron has declined $1, concessions are being made in eastern Pennsylvania and Northern iron is being sold at St. Louis on a basis of $22, Chicago.

Circumstantial reports of large sales of Buffalo iron to an important foundry interest have had wide currency, but are strangely without confirmation.

While wage reductions are not considered imminent at iron and steel works, some of the large independent coal and coke companies in the Connellsville district have announced lower wages in line with those lately put in effect at smaller operations. The Nov. 10, 1917, scale is thus restored, the average cut being 33 1/3 per cent. No reduction has been made as yet by the H. C. Frick Coke Co., the Steel Corporation's subsidiary. Acceptance of the lower wage is general, as work paying as much as mining and coke making is not easily obtainable.

New business in cast iron pipe is in lessening volume and prices are more flexible, concessions of $1 a ton being more common. Pipe makers say that even if but half the bond issues now proposed by municipalities result in purchases there would be a good scale of plant operations.

Several grades of scrap consumed in eastern Pennsylvania have advanced 50c. a ton or more in the past few days, due to slightly improved demand, but there is no disposition to generalize on this departure from the general price trend.

In Germany the Krupp plants are curtailing operations drastically. Some of the Thyssen blast furnaces have been shut down. The Phoenix Company has discharged its 12,000 employees and the Dortmund Union is closing completely. Other producers contemplate like steps. French authorities, meanwhile, are moving to insure the maintenance of coke supplies to France and have commandeered surface fuel stocks.

Another drop in foundry pig iron brings THE IRON AGE pig iron composite price to $20.98, the lowest point in six months, and comparing with $28.79 one year ago.

Weakness in bars and beams has brought THE IRON AGE finished steel composite price to 2.624c. per lb., the lowest figure in more than 15 months. It was 2.789c. one year ago.

Pittsburgh

Prices Seem Near Bottom—Production at About 50 Per Cent of Capacity

PITTSBURGH, May 27.—The best thing that can be said about steel business is that it is no worse than it has been, but it likewise is no better than it has been, and in the effort of manufacturers to bring about a balance between production and consumption, there has been a rather steep recession in steel works operations. It is doubtful whether ingot production in this and adjacent districts now is over 50 per cent of capacity. The number of open-hearth furnaces and Bessemer converters in operation is about 50 per cent of the whole, but actual production is probably 10 per cent less than would be indicated merely on a numerical basis, as there is no disposition anywhere to crowd

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	May 27, 1924	May 20, 1924	Apr. 29, 1924	May 29, 1923
No. 2X, Philadelphia‡	*$22.40*	$22.76	$22.76	$32.76
No. 2, Valley Furnace†	20.50	20.50	21.00	29.00
No. 2, Southern, Cin'ti†	25.05	25.05	26.05	29.55
No. 2, Birmingham, Ala.†	21.00	21.00	22.00	25.50
No. 2 foundry, Chicago*	22.50	22.50	23.50	32.00
Basic, del'd, eastern Pa.	21.00	21.00	21.50	30.00
Basic, Valley furnace	20.00	20.00	21.00	27.50
Valley Bessemer del. P'gh.	23.76	23.76	24.26	30.77
Malleable, Chicago*	22.50	22.50	23.50	32.00
Malleable, Valley	20.50	20.50	21.50	29.00
Gray forge, Pittsburgh	21.76	21.76	22.26	30.27
L. S. charcoal, Chicago	29.15	29.15	29.15	36.65
Ferromanganese, furnace	107.50	107.50	107.50	130.00

Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	38.00	38.00	40.00	43.00
O.-h. billets, Pittsburgh	38.00	38.00	40.00	45.00
O.-h. sheet bars, P'gh	40.00	40.00	41.00	45.00
Forging billets, base, P'gh.	43.00	43.00	45.00	55.00
O.-h. billets, Phila.	43.17	43.17	43.17	50.17
Wire rods, Pittsburgh	48.00	48.00	51.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	*2.20*	2.25	2.25	2.45
Light rails at mill	1.90	1.90	2.00	2.25

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.47	2.47	2.52	2.72
Iron bars, Chicago	2.25	2.25	2.30	2.60
Steel bars, Pittsburgh	*2.20*	2.25	2.25	2.40
Steel bars, Chicago	2.25	2.25	2.35	2.74
Steel bars, New York	2.59	2.59	2.59	2.74
Tank plates, Pittsburgh	2.20	2.20	2.20	2.50
Tank plates, Chicago	2.40	2.40	2.45	2.84
Tank plates, New York	*2.34*	2.44	2.54	2.84
Beams, Pittsburgh	*2.20*	2.25	2.25	2.50
Beams, Chicago	2.45	2.45	2.45	2.84
Beams, New York	*2.44*	2.49	2.59	2.84
Steel hoops, Pittsburgh	2.75	2.75	2.90	3.30

Sheets, Nails and Wire,	May 27, 1924	May 20, 1924	Apr. 29, 1924	May 29, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.60	3.60	3.60	3.85
Sheets, galv., No. 28, P'gh.	4.80	4.80	4.85	5.00
Sheets, blue an'l'd, 9 & 10	2.80	2.80	2.85	3.00
Wire nails, Pittsburgh	2.90	2.90	3.00	3.00
Plain wire, Pittsburgh	2.65	2.65	2.75	2.75
Barbed wire, galv., P'gh.	3.70	3.70	3.80	3.80
Tin plate, 100-lb. box, P'gh.	$5.50	$5.50	$5.50	$5.50

Old Material, Per Gross Ton:				
Carwheels, Chicago	$16.50	$16.50	$16.00	$22.50
Carwheels, Philadelphia	17.00	17.00	17.00	23.00
Heavy steel scrap, P'gh	*15.50*	16.00	15.50	21.50
Heavy steel scrap, Phila.	*15.00*	14.50	15.00	19.00
Heavy steel scrap, Ch'go	*13.75*	14.00	13.50	19.00
No. 1 cast, Pittsburgh	*17.50*	18.00	18.00	25.50
No. 1 cast, Philadelphia	17.00	17.00	17.00	23.50
No. 1 cast, Ch'go (net ton)	*17.00*	17.50	18.00	22.50
No. 1 RR. wrot. Phila.	16.50	16.50	17.00	23.00
No. 1 RR. wrot. Ch'go (net)	*11.75*	12.00	12.25	16.50

Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$3.25	$3.25	$3.75	$4.75
Foundry coke, prompt	*4.50*	4.75	4.75	5.75

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*13.00*	13.12½	13.62½	15.50
Electrolytic copper, refinery	*13.50*	12.62½	13.12½	14.75
Zinc, St. Louis	*5.72½*	5.77½	6.00	6.40
Zinc, New York	*6.07½*	6.12½	6.35	6.75
Lead, St. Louis	*6.65*	7.00	7.50	7.05
Lead, New York	*7.00*	7.15	7.87½	7.30
Tin (Straits), New York	*41.50*	40.50	43.25	41.75
Antimony (Asiatic), N. Y.	*8.50*	8.75	9.00	7.00

*The average switching charge for delivery to foundries in the Chicago district is 61c per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Composite Price, May 27, 1924, Finished Steel, 2.624c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

May 20, 1924,	2.639c.
April 29, 1924,	2.653c.
May 28, 1923,	2.789c.
10-year pre-war average,	1.689c.

Composite Price, May 27, 1924, Pig Iron, $20.98 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

May 20, 1924,	$21.04
April 29, 1924,	21.88
May 28, 1923,	28.79
10-year pre-war average,	15.72

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production and in a number of instances 10 and 12 hours are being allowed per heat of steel as against 8 to 10 hours, the rush time practice in open-hearth furnace operation. A week ago the average rate in this and nearby districts was around 60 per cent. Four additional blast furnaces, three by the Carnegie Steel Co. and one by the Wheeling Steel Corporation, have ceased production during the past week. This brings the number of active stacks to 73, as against 114 at the end of March.

While the week has brought no increase in business, it has developed some indications that prices, if not actually at a bottom, are very close to one. Judge Gary's remarks at last week's meeting of the American Iron and Steel Institute, in connection with the steel Corporation ideas about wages, it is believed, will have a tendency to restrain the naming of much lower prices than prevail today, since only through lower wages would it be possible to show a margin of profit at less than today's levels. Although it has happened before that independent company wages have declined before those of the Steel Corporation, there are no signs that this will happen this year; indeed, some of the independent companies' presidents have been quick to enter denials that wage reductions were in contemplation.

There are occasional indications that consumers have about completed the liquidation of their stock, as is evident from a telegraphic order for 800 tons of sheets from an automobile manufacturer received by one company here recently, and the fact that some

users of black sheets are making inquiries for third quarter tonnages. There is an impression that business in other directions would show a tendency toward improvement if buyers were convinced that prices were as low as they were going to be. Stocks of steel in manufacturers' hands are believed to be fairly heavy, but as an influence upon prices it is considered to be a more favorable condition that the manufacturers rather than consumers have the stocks.

Such changes as have taken place in steel prices in the past week have been downward. The market no longer is quotable above 2.75c. on hoops and bands, and it has settled pretty definitely to $2.65, base, for plain wire and to $2.90, base, for wire nails, while on plates, shapes and bars there is no longer much disposition to claim that 2.25c. is the minimum even in the area where Pittsburgh mills have a freight advantage over outside producing centers. There has been some talk of a possible decline in pipe prices, but producers claim that business still is good and that the occasion for a cut does not exist.

Activity still is lacking in the pig iron market and because of that fact there is not much of a market for coke. Wage reductions just announced by independent coke producers in the Connellsville district amounting roughly to about 33 1/3 per cent, match up with the low prices they have lately had to accept to market their product. Light scrap has stiffened in price, but the general trend of the market is lower, because the demand from consumers still is very limited.

Pig Iron.—A merchant furnace interest with stacks in western Pennsylvania and the Lake front reports sales over the past week or ten days aggregating 90,000 tons of the various grades of iron, including one fair-sized block of malleable at a delivered price of $23.27 to an Indianapolis melter. A considerable tonnage of foundry iron also is involved in these sales, settlements to be based upon trade paper averages. The Cumberland, Md., tin plate maker has put out an inquiry for 500 to 1500 tons of basic per month for July, August and September shipments. A local car builder closed for about 600 tons of basic iron of special analysis with reference to silicon content, at $20, Valley furnace. We also note a sale of 500 tons of standard basic iron at $20, Valley furnace. Otherwise the market has been dull and featureless except that producers are showing a tendency to make a stand at today's prices. Only small lots of foundry and Bessemer iron are moving. Carnegie Steel Co. has put off one Carrie furnace, one at Farrell and one at New Castle, and now has only 33 furnaces in production out of a total of 58. Wheeling Steel Corporation is dropping one furnace at its Labelle Works, Steubenville, Ohio.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$20.00 to $21.00
Bessemer	22.00
Gray forge	20.00 to 20.50
No. 2 foundry	20.50 to 21.00
No. 3 foundry	20.00 to 20.50
Malleable	20.50 to 21.00
Low phosphorus, copper free	29.00

Ferroalloys.—There is no occasion to change prices this week. Demand remains very light, but as producers doubt that lower prices would bring out orders they are disposed to stand at the prices they have been quoting for several weeks. Prices are given on page 1609.

Semi-Finished Steel.—Steep curtailment of steel production over the past two months, which has brought down ingot output in this and nearby districts from about 90 per cent to an average of less than 60 per cent of capacity, does not yet appear to have brought about a balance between supply and demand in semi-finished material. Cut in production of raw steel has practically caught up with the decrease in the demand for finished products, but there is no longer any doubt that the production of the former over the first quarter of the year was partly anticipatory of a spring and summer demand for finished products, which has not developed and most companies which are dependent upon outside sources for their steel are now carrying rather heavy stocks. Current interest in the market, consequently, is very limited, and present prices, although $2 to $3 a ton below those prevailing over the first quarter are purely nominal. If present finished steel prices could be held, it might be possible to maintain $38, Pittsburgh or Youngstown, for billets and slabs and $40 for sheet bars, but those prices are not interesting to sheet and strip markers, who naturally, if they were in the market, would want raw material at prices that would permit profitable conversion at lower prices of finished steel prices than rule today. It is a common report that specifications against wire rod contracts are no freer at today's prices of $48 and $49, base, than they were at a higher level. Wire products and other products into which rods enter are not moving with enough snap to give the rod market much life. Prices are given on page 1609.

Iron and Steel Bars.—Desire for orders for steel bars has increased to a point where it is impossible for mills here and in Youngstown to satisfy that desire and maintain the recent base of 2.25c., Pittsburgh, even in the area where these mills have a freight advantage over those in outside districts. Actually 2.20c., base, has become the prevailing price on lots of a carload or more, with 2.25c. the price on the small lots or those that are unattractive from a mill standpoint. The biggest outlet for steel bars is to cold-finished bar makers and manufacturers of bolts, nuts and rivets, and both of these lines just now are going through extremely quiet times. Iron bars are dull and the right sort of an order would bring out lower prices. For prices, see page 1608.

Structural Material.—Tapering scale of structural awards is closely reflected in the demand for plain material and few mills now have much business on their books for future delivery. This particular district is not producing enough business to add materially to order books and local mills find it necessary to go outside to get business. In the area where they have a freight advantage over outside mills business is being taken at 2.20c. to 2.25c. and that range is properly representative of the Pittsburgh market, but not outside of it. Prices are given on page 1608.

Wire Products.—Business still is very slack with all makers in this district, and if prices are the chief reason that buyers have been holding off then the reduction which became general about two weeks ago has been a failure. Interest in the market actually is less at $2.90, base, per keg for nails and $2.65, base, per 100 lb. for plain wire than it was at levels $2 a ton higher. Having won one concession, buyers are pressing their advantage and the mills having built up stocks over the past few months seem unable to resist the pressure of buyers as successfully as they could if they did not have stocks to liquidate. There is no longer any necessity for higher prices than $2.90 per keg for nails and $2.65 per 100 lb. for plain wire, and more is not being sought or obtained. Prices are given on page 1608.

Steel Rails.—Demand for light rails still is very limited. The prevailing price of 1.90c., base, mill, for billet rails is bringing out few, if any, more orders than did the price of 2c., base. Betterment in the coal situation is not of a sort to encourage heavier operations or development work and a good market for light rails is unlikely until there is a real coal market.

We quote light rails, rolled from billets, 1.90c. to 2c. base (25-lb. to 45-lb.); rolled from rail steel, 1.85c. to 1.90c. base (12-lb. to 45-lb.), f.o.b. mill; standard rails, $43 per gross ton mill, for Bessemer and open-hearth sections.

Tubular Goods.—Pipe business is good by comparison with that in other finished lines, but it suffers by comparison with some other years at this season. Building work has not caused the drafts upon jobbers' stocks of standard pipe it was expected to and by marked contrast with the conditions of last year and the year before at this time, the jobbers are seeking only small lots to round out depleted sizes instead of trying to

obtain increased allotments on their contracts. Jobber buying of oil country pipe is steady, but entirely lacking in the urgency noted last year and in 1922 at this season. Mills are having no trouble in supplying all demands and there is some building of mill stocks. There are no intimations of lower prices despite the declines in other lines, particularly in plate and skelp prices. The situation in boiler tubes is as dull and depressed as it has been at any time recently and the relation between card discounts and actual selling prices grows more remote. Discounts are given on page 1608.

Plates.—While some mills still are quoting 2.25c., base, Pittsburgh, sales at above 2.20c. except of very small tonnages, are becoming exceptional. There are no important inquiries before the mills and most of them are nearing the end of their order books. Prices are given on page 1608.

Hot-Rolled Flats.—The past week has seen a disappearance of higher prices than 2.75c. base, Pittsburgh, on hoops and bands and that price also is the maximum on the narrower sizes of strips. Strip makers now are quoting 2.75c. for material 3 in. and less in width, and 2.60c. for wider stock, although there are occasional dips to as low as 2.50c. on the latter to meet plate and blue annealed competition. Carnegie Steel Co. is not planning to open its season on cotton ties before July 1, evidently figuring that by that date the price of hoops upon which the price of ties is based will be more definitely established than is the case just now. A base of 2.75c. for hoops would indicate a price of about $1.44 per 45-lb. bundle. Prices are given on page 1608.

Sheets.—It is asserted that the number of mills now taking business at less than the prevailing independent prices of 3.65c., base, for black, 2.80c., base, for blue annealed and 4.80c., base, for galvanized, is fewer than was the case recently, but mills quoting these prices still are encountering lower prices and we continue our recent price ranges. Independent mill operations for the first half of May averaged 55 per cent; they have increased somewhat lately, but it is doubtful whether the entire month will show much more than a 55 per cent rate. The industry as a whole, taking in the American Sheet & Tin Plate Co., is running about 56 per cent of capacity. There has been no increase in the demand from the automotive industry and hopes do not run strong of early improvement in that direction, as private Detroit advices suggest that the liquidation of stocked cars is rather slow work. Prices are given on page 1608.

Tin Plate.—Current demand for tin plate is very light and the mills are finding it necessary to store a considerable part of current production against orders because of the inability of can makers to provide shipping instructions. Backwardness of the season creates doubts as to the probable size of the demand for cans from the packers and the can makers are not reducing their stocks of cans very rapidly. Recent Japanese export order for about 56,000 boxes, it is reported, went at a price well below the English or domestic price, but as a rule there is pretty close adherence to the established price of $5.50 per base box, Pittsburgh, for standard cokes. The leading interest, as a result of the exhaustion of storage space, has been obliged to curtail production, but independents in this district still are running practically full.

Cold-Finished Steel Bars and Shafting.—The market is extremely dull. Shafting demands have been light throughout the year and now there is only a limited market for screw stock on account of the very low rate of production of automobiles. There is hardly enough passing business to provide a test of prices, but a range of 2.90c. to 3c., base, Pittsburgh, is probably more representative of the market than a single price of 3c. Ground shafting is priced at 3.40c., base, f.o.b. mill for carload lots.

Track Supplies.—Recent prices are continued, but so far as actual sales are concerned the minimum quotations are the prevailing ones and even these would be shaded on attractive inquiries. Actual business is very light and most makers are nearing the end of their orders for spikes and tie plates. Prices are given on page 1608.

Cold-Rolled Strips.—Activity still is lacking and likewise a test of prices, since the tonnages sought are not of a size to create competition. Under the circumstances the market is quotable at the common asking price of 4.50c. base, Pittsburgh.

Bolts, Nuts and Rivets.—Reports as to business vary somewhat, some makers having a fairly good trade, while others find matters quiet. The report about prices, however, is uniform that they are low and unprofitable. There seems to be more stability to rivet prices than to those of bolts and nuts. Discounts and prices are given on page 1608.

Coke and Coal.—The market here for coke still is a very narrow one. So many blast furnaces running on Connellsville coke have gone out in the past six weeks that producers have considerable difficulty in marketing current production, which is now only about half of that of the early part of March. Spot furnace coke is quoted from $3.25 to $3.50, but on recent business $3.35 has been the prevailing maximum. Spot foundry coke ranges from $4.50 to $5 for the better known brands. The wage reduction just announced in the Connellsville district which reestablishes the schedules of late 1917 will probably be helpful to the operators in meeting West Virginia and Kentucky competition on coal, but it does not mean much when viewed from the angle of coke. Because the prospective demand is so light, the coal market still is inactive and we make no change in prices. Mine run steam coal ranges from $1.50 to $1.75 per net ton at mine, coking grade from $1.75 to $2, and gas coal from $2 to $2.25. Slack coal heads right around $1.25 for steam and $1.35 to $1.40 for gas.

Old Material.—The market shows decided strength on the lighter grades of scrap, such as turnings and borings, supplies of which are much restricted by the slowing down of machine shop activities, particularly in the Detroit district, but has grown somewhat softer on heavy melting steel and the other open-hearth grades. Mills in this district have not responded to efforts of dealers to create a market around $16 for heavy melting steel; this has caused some revision of ideas by dealers and the situation also has been weakened by the fact that producers, having exhausted storage facilities, have been obliged to move some material. Foundry grades are easy. Heavy melting steel has been offered at $16 without takers and probably could be bought at $15.50, this for moderate tonnage for quick delivery, as sellers would not take round tonnages for future delivery at either figure. Machine shop turnings have sold at $13 to $13.50, and borings about $1 a ton higher. About 45,000 net tons of scrap is on the June list of the Pennsylvania Railroad, bids for which will be received until noon June 3.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton

Heavy melting steel	$15.50 to $16.00
No. 1 cast, cupola size	17.50 to 18.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.00 to 17.50
Compressed sheet steel	13.50 to 14.00
Bundled sheets, sides and ends	12.50 to 13.00
Railroad knuckles and couplers	19.00 to 19.50
Railroad coil and leaf springs	19.00 to 19.50
Low phosphorus blooms and billet ends	20.00 to 20.50
Low phosphorus plate and other material	19.00 to 19.50
Railroad malleable	15.00 to 15.50
Steel car axles	19.00 to 19.50
Cast iron wheels	16.00 to 16.50
Rolled steel wheels	19.00 to 19.50
Machine shop turnings	13.00 to 13.50
Sheet bar crops	16.00 to 16.50
Heavy steel axle turnings	14.50 to 15.00
Short shoveling turnings	13.00 to 13.50
Heavy breakable cast	16.00 to 16.50
Stove plate	13.50 to 14.00
Cast iron borings	14.00 to 14.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	16.00

Chicago

Very Little Buying of Pig Iron or Finished Material—Stocks Not Large

CHICAGO, May 27.—New business is exceptionally light in practically all departments of the iron and steel market. Prices, while weak, remain substantially unchanged. Furnace and mill operations likewise have not suffered any further losses. The steel output of the two leading producers of heavier products remains at 70 per cent and out of their 30 blast furnaces 17 are still active. A smaller steel interest continues to operate its three stacks and is rolling steel at a 50 per cent rate. A non-integrated independent producing bars and wire products is also on a 50 per cent basis. There have been no further changes in merchant blast furnace operations. Generally speaking, pig iron and steel producers alike are operating on sharply reduced backlogs and the same condition appears to obtain among their manufacturing customers. Buying all the way from primary materials to finished commodities for the ultimate consumer is at a low ebb. On the other hand, few buyers of iron and steel are burdened with heavy stocks; hence it is logical to expect a change in the general business situation to be quickly reflected in fresh orders on the furnaces and mills.

Building construction is still of large proportions, although it is notable that less new work is being undertaken. It is particularly noteworthy that residential building is less active.

Railroad car buying is almost nil, but the carriers are specifying liberally against their rail and track supply contracts, indicating that they are carrying out their track work as originally planned. While car purchases at the moment are light, liberal orders placed during the first quarter will occupy Western carbuilders until September.

Pig Iron.—The market remains very quiet, although some sellers find encouragement in an increase in carlot sales. Most current business is moving at $22.50, base local furnace, but it is possible that better than this could be done on an attractive tonnage. The trade, however, is of the opinion that the market will not sink much, if any, lower, in view of production costs. Melters' operations are admittedly on a reduced basis, but their stocks likewise are low and for this reason an increase in buying is expected to develop. The only current inquiry of any size, however, is one from a Milwaukee user for 500 tons of foundry for June, July and August delivery. No sales of Southern iron are reported. Two carlot sales of silvery were negotiated at the Jackson County schedule. A few carload lots of charcoal have been sold at unchanged prices.

Quotations on Northern foundry, high phosphorus, malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$29.15
Northern coke, No. 1, sil. 2.25 to 2.75	23.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	22.50
Malleable not over 2.25 sil	22.50
Basic	22.50
High phosphorus	22.50
Southern No. 2	27.01
Southern No. 2 (barge and rail)	24.68
Low phos., sil. 1 to 2 per cent, copper free	30.50
Solvery, sil. 8 per cent	35.29
Electric ferrosilicon, 14 to 16 per cent	45.42

Ferroalloys.—We note two carlot sales of ferromanganese at $107.50, seaboard. Some resale material, however, has moved at concession of $1 to $1.50 a ton. A carload of spiegeleisen has been purchased by a local melter.

We quote 80 per cent ferromanganese, $115.06; delivered; 50 per cent ferrosilicon, $75, delivered; spiegeleisen, 18 to 22 per cent, $42.56 to $43.56, delivered.

Plates.—In a listless market prices have undergone no further changes. Nothing lower than the quotations appended below has been reported except in intermediate territories where the competition of other producing centers had to be met. The Standard Oil Co. of Louisiana has awarded tanks involving 1400 tons to the Petroleum Iron Works. The Magnolia Petroleum Corporation has let five tanks requiring 1000 tons for erection in Texas. The steel for the Chesapeake & Ohio cars, amounting to close to 100,000 tons of plates, shapes and bars, has finally been distributed, approximately one-half going to a local independent and the remainder to the leading interest.

The mill quotation is 2.40c. to 2.45c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Structural Material.—The fabricating contract for the W. F. Hall Printing Co. plant, Chicago, involving 3800 tons, has been awarded to North Works, Illinois Steel Co. There were few other lettings during the week and they were small. Prominent among new projects is an addition to the San Bernardina, Cal., shops of the Santa Fe, requiring 4500 tons. Another fresh inquiry is the Jonathan Club Building, Los Angeles, involving 1000 tons. All bids were rejected on the Roosevelt Hotel, New Orleans, 3400 tons, because figures tendered exceeded the architect's estimates by 66 2/3 per cent. Plain material prices lack stability, but the appended quotation is still representative.

The mill quotation on plain material is 2.45c., Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Bars.—Demand is light and prices are flexible, although the price range is substantially the same as a week ago. Inquiries are few and involve small tonnages, too small to bring out further concessions. Bar iron mills find it difficult to maintain operations, although small orders are being booked at 2.25c. to 2.30c. Chicago. Rail steel bar mills are on a single turn basis, with little new business coming in.

Mill prices are: Mild steel bars, 2.25c. to 2.35c., Chicago; common bar iron, 2.25c. to 2.30c., Chicago; rail steel, 2.20c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 4c. for rounds and 4.50c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.45c. to 2.60c., base; hoops, 4.45c.; bands, 3.95c.

Sheets.—In the absence of active demand mills are not quoting such extreme prices as heretofore, evidently because they have failed to stimulate buying. On galvanized 4.80c. base Pittsburgh appears to be the minimum going price, while the minima on black and blue annealed are 3.65c. and 2.80c., respectively.

Mill quotations are 3.65c. to 3.85c. for No. 28 black, 2.80c. to 3c. for No. 10 blue annealed, and 4.80c. to 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago: 4c. for blue annealed; 4.70c. for black and 5.60c. for galvanized.

Wire Products.—Business shows no turn for the better; in fact, inquiries are so small that there is little inducement to make further concessions in prices. General mill operations probably do not exceed 50 per cent. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1608.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, 3.55c. to 3.80c. per 100 lb.; cement coated nails, 3.10c. to 3.25c. per keg.

Rails and Track Supplies.—The railroads are specifying freely against their rail and fastening contracts and, in addition, are placing miscellaneous fresh orders for track supplies. Scattered orders for spikes total 5000 kegs, and in each case quick delivery was asked. There are a number of active inquiries for tie plates and angle bars.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 2.10c., f.o.b. makers' mills.

Standard railroad spikes, 3.10c. mill; track bolts with square nuts, 4.10c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.75c. base, and track bolts, 4.75c. base.

Cast Iron Pipe.—New business is in diminishing volume and prices are more flexible, concessions of 50c. and $1 a ton having been made in extreme cases. Pipe makers, however, are optimistic, stating that they will have good business even if half the bond issues thus far passed by municipalities should not result in purchases. They also point out that the market for municipal bonds is better during times of business reaction than in times of general industrial activity. Summit County, Ohio, has awarded 1000 tons to James B. Clow & Sons. The National Cast Iron Pipe Co. will furnish 800 tons for Columbus, Ohio. Toledo took bids yesterday on 800 tons of 6- and 8-in. Jacksonville, Ill., takes figures June 2 on 343 tons of 16-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $59.20 to $60.20; 6-in. and over, $55.20 to $56.20; Class A and gas pipe, $5 extra.

Bolts and Nuts.—The market is now generally quotable at 60 and 20 off, Chicago, for large bolts, but little new business is being booked. Bolt makers regard it as futile to attempt to stimulate demand through still further concessions.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.95c.; machine bolts up to ⅞ x 4 in., 55 and 5 per cent off; larger sizes, 55 and 5 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 50 and 5 off; hot pressed nuts, squares and hexagons, tapped, $3.50 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 and 5 per cent off.

Old Material.—In the utter absence of consumer buying, prices are rather uncertain. That some dealers are speculating on an advance in the market is indicated by comparatively attractive prices paid to the railroads. On the other hand, actual transactions between the trade to fill expiring orders indicate that quotations are lower on some items. Railroad offerings, which are heavy, are as follows: Pennsylvania, 42,000 tons; Burlington, 6300 tons; St. Paul, 1800 tons, and the Big Four and Michigan Central, blank lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$17.00 to $17.50
Cast iron car wheels	16.50 to 17.00
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels	17.00 to 17.50
Railroad tires, charging box size	17.50 to 18.00
Railroad leaf springs, cut apart	17.50 to 18.00
Rails for rolling	15.00 to 15.50
Steel rails, less than 3 ft.	17.00 to 17.50
Heavy melting steel	13.75 to 14.25
Frogs, switches and guards cut apart	14.00 to 14.50
Shoveling steel	13.50 to 14.00
Drop forge flashings	10.50 to 11.00
Hydraulic compressed sheets	11.00 to 11.50
Axle turnings	12.00 to 12.50
Steel angle bars	16.00 to 16.50
Steel knuckles and couplers	17.00 to 17.50
Coil springs	19.00 to 19.50
Low phos. punchings	15.50 to 16.00
Machine shop turnings	7.00 to 7.50
Cast borings	10.00 to 10.50
Short shoveling turnings	10.00 to 10.50
Railroad malleable	17.50 to 18.00
Agricultural malleable	17.00 to 17.50

Per Net Ton

Iron angle and splice bars	16.00 to 16.50
Iron arch bars and transoms	17.00 to 17.50
Iron car axles	25.00 to 25.50
Steel car axles	16.50 to 17.00
No. 1 busheling	9.50 to 10.00
No. 2 busheling	7.50 to 8.00
Pipes and flues	8.00 to 8.50
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	12.25 to 12.75
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.50 to 17.00
No. 1 agricultural cast	16.50 to 17.00
Locomotive tires, smooth	14.75 to 15.25
Stove plate	14.00 to 14.50
Grate bars	14.00 to 14.50
Brake shoes	14.50 to 15.00

Reinforcing Bars.—The market situation is substantially unchanged. A fair amount of tonnage continues to be placed and much work is still pending. A range of 2.45c. to 2.50c., Chicago warehouse, appears to be representative of current prices. Lettings include:

Hartman Furniture Co. building, Chicago, 800 tons to Joseph T. Ryerson & Son.

Our Lady of Mercy Convent high school, Milwaukee, 210 tons to Concrete Steel Co.

St. Agnes Hospital, Fond du Lac, Wis., 200 tons to American System of Reinforcing.

Bates Valve Bag Co. building, South Chicago, 150 tons to Joseph T. Ryerson & Son.

St. Cyril's School, Chicago, 125 tons to Concrete Engineering Co.

Administration building for Shorewood High School, Milwaukee, 120 tons to Concrete Steel Co.

Lindemann & Hoverson Co. warehouse, Chicago, 450 tons to Olney J. Dean.

Mansfield Apartment, Sixty-fourth Street and Cottage Grove Avenue, Chicago, 100 tons to Concrete Steel Co.

Pending work includes:

Prince Masonic Temple, Chicago, 200 tons.

Illinois Masonic Hospital, 834 Wellington Avenue, Chicago, George F. Schreiber, architect, 100 tons.

Miami Fort power station, Cincinnati, 600 tons, Sargent & Lundy, Chicago, engineers.

Steel Men to Attend Foreign Trade Convention

Steel and allied industries will be well represented at the eleventh National Foreign Trade convention, to be held in Boston, June 4, 5 and 6. James A. Farrell, president United States Steel Corporation, and chairman National Foreign Trade Council, under whose auspices the convention is to be held, will preside and sound the keynote of the gathering in an address on "Wider Markets for American Prosperity."

Among the delegates are:

W. H. Stewart, vice-president, and T. T. Harrow, Bethlehem Steel Export Corporation; Robert E. Belknap, New England sales manager Bethlehem Steel Co.; John D. Stodder, export manager Wickwire Spencer Steel Corporation; H. A. Carmichael, treasurer Westinghouse Electric International Co.; Edward D. Crowell, export manager Union Drawn Steel Co.; M. A. Oudin, vice-president International General Electric Co., Inc.; Walter Stevens, vice-president Thomas A. Edison, Inc.; A. S. Durrant, general sales manager International General Electric Co., Inc.; H. Sanborn Smith, first vice-president Gulf States Steel Co.; Clinton S. Marshall, district manager American Steel & Wire Co.; H. W. Heinrich, assistant export manager Yale & Towne Mfg. Co.; P. G. Merrow, treasurer Merrow Machine Works; John Hughes and Harold Hughes, United States Steel Corporation; E. P. Thomas, T. P. Alder, C. E. Thomas, J. H. McAlarney and Lewis Pfeiff, United States Steel Products Co.; William G. Kaylor, Westinghouse Air Brake Co.; John R. Powelson, Chicago Pneumatic Tool Co.; William Pigott, Pacific Car & Foundry Co.; Merle J. Trees, Chicago Bridge & Iron Works; E. B. Freeman, B. F. Sturtevant Co.; R. C. Foster, vice-president Stockham Pipe & Fittings Co.; George G. Crawford, president Tennessee Coal, Iron & Railroad Co.; Julius Goslin, president Joubert & Goslin Machinery & Foundry Co.; Thomas C. Ham, Frank S. Slocum, J. C. Watson, Frank M. Harbison, A. H. Holliday, Jones & Laughlin Steel Corporation; J. Rogers Flannery, president Flannery Bolt Co., and S. Foster Hunt, Nicholson File Co.

The convention is expected to bring together nearly 3000 foreign traders, who will consider the practical aspect of wider markets as a means to greater American prosperity. They will also consider American foreign trade policy, foreign loans as a trade builder, banking facilities for foreign trade, education for foreign trade, special export and import problems, the American merchant marine, advertising in foreign trade, and many other subjects connected with the extension of American trade overseas.

The Dominion Engineering Works, Ltd., Montreal, Que., has been incorporated with a capital stock of $2,500,000, to acquire and take over the plant and business of the company of the same name now operating in Montreal. The Dominion Engineering Works, which is controlled by the Dominion Bridge Co., Ltd., had an operating loss of $35,401 during the year ending with Dec. 31, 1923. This loss does not include any provision for depreciation, for which no allowance was made. The deficit at the close of the previous year was $186,386, to this was added the operating loss for 1923, and the sum of $18,880 as provision for bad debts, making a total profit and loss deficit at Dec. 31, 1923, of $240,667. The balance sheet shows current assets at $968,262, and current liabilities of $941,101, leaving net working capital at $27,161. The largest item among the current assets is accounts receivable, which amount to $570,906, after provision for bad and doubtful debts. Inventories of raw material, supplies and manufactured stock stand at $214,434, and work in progress at $131,726. Cash on hand amounts to $23,141.

New York

Fabricators Making Very Low Prices—Steel Market Still Drifts

NEW YORK, May 27.—Considerable intangible inquiry for pig iron is pending, but reports of the purchase of a large tonnage by one company are not confirmed and the transaction most favorable to the sellers, because the company is regarded as a conservative buyer, is the purchase of 4800 tons by the Ingersoll-Rand Co., which had inquired for only 3100 tons. Sales in New England include 1600 tons to a fire extinguisher company and 3000 tons to a heater company. The largest definite inquiry pending now is from the Worthington Pump & Machinery Corporation for 7200 tons to be distributed to a number of its plants. Several companies which have been inquiring for last half delivery find furnaces as a rule quoting only for the third quarter, and it has not been easy to place the tonnage. Prices are weak and in eastern Pennsylvania $21 furnaces has been shaded, while reports indicate that the range is about the same as last week at Buffalo, $19.50 to $20.

We quote delivered in the New York district as follows, having added to furnace price $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1X fdy., sil. 2.75 to 3.25	$24.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.77
East. Pa. No. 2, sil. 1.75 to 2.25	$23.27 to 23.77
Buffalo, sil. 1.75 to 2.25	24.41 to 24.91
No. 2X Virginia, sil. 2.25 to 2.75	31.44
No. 2 Virginia, sil. 1.75 to 2.25	30.44

Ferroalloys.—Now and then a carload of ferromanganese is disposed of in an exceedingly quiet market. Demand for spiegeleisen is no more active than that for ferromanganese, reduced steel operations being the natural explanation. Combined imports of ferromanganese and spiegeleisen in April were 6066 gross tons, of which 1986 tons was spiegeleisen and 4080 tons ferromanganese. Both of these items are the largest imports of any month this year. Manganese ore imports in April were 29,729 tons, bringing the average per month for the first four months to 25,820 tons. In 1923 the average was 17,170 tons per month.

Cast-Iron Pipe.—Fairly active demand continues from private water and gas companies, but municipal tenders, particularly from the New England district, are still scarce. Felix Hanratty, New York, contractor, has awarded the 1000 tons or more of 48-in. pipe involved in a contract received from the Department of Water Supply Gas and Electricity, New York, to the Warren Foundry & Pipe Co. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $61.50 to $63.60; 4-in. and 5-in., $66.60 to $68.60; 3-in., $76.60 to $78.60, with $5 additional for Class A and gas pipe. Purchases of soil pipe are extremely light and while there is still no change in the discounts, there are continued reports of slightly lower quotations. We quote discounts of both Southern and Northern makers, f.o.b. New York, as follows: 6-in., 29½ to 30¾ per cent off list; heavy, 39½ to 40¾ per cent off list.

Warehouse Business.—Prices of bars, plates and shapes continue unchanged, but effective May 26, hoops have been reduced to 4.59c. per lb. and bands to 4.09c. per lb. The new quotations on blue annealed sheets are lower by 20c. per 100 lb., No. 10 gage being quoted at 4.14c. per lb. Black and galvanized sheets are unchanged and fairly firm at a minimum of 4.85c. and 5.85c. per lb. base respectively. Some shading of 5c. to 10c. per 100 lb. continues among the smaller dealers, but such activity has been thus far evidently insufficient to affect the general run of the market. Warehouses handling pipe report a continuation of small orders in fairly good volume. We quote prices on page 1632.

Finished Iron and Steel.—The steel market continues to drift aimlessly, and there is less optimism that there will be any important change for the better within the next few months. Consumers and jobbers are filling their needs in small-lot purchases. The most favorable aspect of the situation is that stocks of steel in the hands of consumers and jobbers are below rather than above normal requirements. Structural steel is fairly active, although the strike of erectors in New York has lessened the amount of work being let in the metropolitan district. A feature this week is a number of small bridges for railroads and highway construction. Many of the railroads have programs for continuous bridge building throughout the remainder of the year. Fabricated steel prices are low, some fabricators in recent bids having sacrificed not only profits but have also slashed estimated costs. The plate market has been weakened further by the purchase of 3500 tons by a locomotive company at a new low price, somewhere below 1.90c., Pittsburgh. Two or three mills quoted 1.90c. and lost the business, the successful bidder having gone at least $1 and possibly $2 below this figure. Steel bars continue fairly firm at 2.25c., Pittsburgh, with occasional concessions of $1 a ton from some mills; shapes are quoted at 2.10c. and 2.15c., Pittsburgh, and are not strong at these figures; prices on plates are difficult to define, the range on ordinary business being from 2c. to 2.10c., Pittsburgh, while in special instances, such as the purchase of the locomotive company, above mentioned, further concessions are made. For example, about 200 tons of still-bottom steel was bought by an oil company at not more than 1.95c., Pittsburgh.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.59c.; plates, 2.34c. to 2.49c.; structural shapes, 2.44c. to 2.64c.; bar iron, 2.49c.

Coke.—The market seems to be holding its own fairly well, the usual quotations on standard foundry continuing at $4.75 to $5.25 per ton and on standard furnace at $3.75 to $4 per ton. On both foundry and furnace coke, the low price can be shaded by about 25c. per ton, where distress tonnages are offered. By-product continues at $10.41, Newark and Jersey City, N. J.

Old Material.—Dullness characterizes the market on all grades. Prices are generally unchanged, as there are few new contracts, mills evidently wishing to reduce higher priced stocks on hand before inventory. Embargoes on shipments to certain consumers in eastern Pennsylvania are reported becoming less drastic. A few small lots of borings and turnings have gone forward to a Sparrows Point, Md., consumer. An early consumption of shipments without the necessity of permits is expected and in some quarters there is a slightly more optimistic tone. Heavy melting steel is unchanged at $14 to $14.50 per ton, delivered eastern Pennsylvania. Borings and turnings and machine shop turnings can hardly be quoted above $11 to $11.50 per ton eastern Pennsylvania and some brokers are unwilling to offer as much as $11 on borings. Stove plate is still being shipped to a New Jersey consumer at about $13.75 per ton delivered.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$10.25 to $10.75
Steel rails, short lengths, or equivalent	11.00 to 11.50
Rails for rolling	14.00 to 14.50
Relaying rails, nominal	24.00 to 25.00
Steel car axles	16.00 to 17.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	14.00 to 14.50
Forge fire	7.50 to 8.00
No. 1 yard wrought, long	13.00 to 13.50
Cast borings (clean)	8.25 to 8.75
Machine-shop turnings	7.25 to 7.75
Mixed borings and turnings	7.25 to 7.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	10.25
Stove plate	10.75 to 11.75
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	No market
Cast iron car wheels	14.00 to 14.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$15.50 to $16.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.50 to 15.00
No. 1 heavy cast, not cupola size	10.50 to 11.00
No. 2 cast (radiators, cast boilers, etc.)	12.50 to 13.00

Buffalo

One of Smaller Radiator Companies Buys—More Interest in Pig Iron

BUFFALO, May 27.—Though the bulk of inquiry during the current period is lighter than reported last week, interest in pig iron buying is considerably greater than it was a few weeks ago. Total inquiry is now reported at 15,000 tons and sales, not all based on this week's inquiry, at 12,000 to 14,000 tons. One local maker now operating its furnaces at a considerably curtailed rate took a fair tonnage for a small radiator company. This maker also took two lots for Erie melters, one of 1500 tons of foundry and one for 500 tons. A sale of 1500 to 2000 tons of malleable closed through a broker is reported and other sales combined to make a total of about 6000 tons for this interest. This maker reports its minimum price to be and to have been $19.50 for No. 2 plain, 1.75 to 2.25 silicon, with the same price for 2.25 to 2.75 sicilon and the same for malleable. This interest is practically out of the market on No. 1 iron, 2.75 to 3.25 silicon. Another maker who reports aggregate sales of 2000 tons, says that this business was placed at $19.50 base and none lower. Another maker has sold 3000 to 4000 tons, it is stated, on a $20 minimum. It announces it will not shade this price for any kind of business. Out of the 15,000 tons of inquiry, the most sizable lot asked for is 7000 tons for the Worthington Pump Co. This lot is for foundry and malleable. Another inquiry from out of the territory and from the East is for 1500 tons of foundry. Scattering inquiries for foundry and malleable are for 800 tons, for 600 tons, two for 500 tons, one for 150 tons and several for 100 tons. Though, as is frequent in a market which is not as strong as it might be, there are numerous reports of low prices, one melter stating that he believed he could do $19 or even $18.50 on a sizable lot, a canvass of the makers does not reveal these prices, but on the contrary something of a stiffer feeling.

We quote f.o.b., gross ton, Buffalo, as follows:

No. 1 foundry, sil. 2.75 to 3.25	$20.50
No. 2 foundry, sil. 2.25 to 2.75	$19.50 to 20.00
No. 2 plain, sil. 1.75 to 2.25	19.50 to 20.00
Basic	19.50 to 20.00
Malleable	19.50 to 20.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—While some sellers see little change in the situation, others believe that more business is to be had now than for some weeks past. One mill representative sees a much better outlook in the structural shape and cold-rolled market. The structural price is reported as 2.25c. to 2.30c. with a considerable number of small lots moving. Bars show some improvement with the 2.25c. price holding fairly well, though the sale of a rather good-sized tonnage is noted at 2.20c. Lower than 2.20c. does not seem to have been quoted in this district. Sheets are stagnant with a tendency toward firming of price. Black sheet price is firm at 3.65c. and galvanized at 4.80c. Canadian business is brighter. The National Tube Co. through its Canadian sales representatives took about 1100 tons of pipe for export to Peru, the tonnage being placed without any concession in price, it is understood. A number of large fabricating projects which have been hanging fire for two or three years across the border, now appear to be nearing definite form, and some Canadian fabricators for the first time have business ahead. Canadian agricultural implement makers are getting some export orders, one noting the first order from Germany since the war. Wire nail demand is slightly improved with the price definitely 2.90c. The Buffalo Sintering Co. is erecting a local plant involving about 250 tons of structural steel placed with a local fabricator and 100 tons of steel will be fabricated locally for an addition to an S. S. Kresge store. Quite a bit of road work is going forward and district inquiries involve about 900 tons of mesh.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5c.; cold-rolled and round shafting, 4.45c.

Old Material.—The market shows very little activity. Mill and open-hearth operations are being curtailed and the demand has fallen off to a minimum. One mill is buying a small lot of heavy melting steel now and then at $13.50, but this is hardly a representative price. Some dealers are picking up heavy melting steel at $15 from time to time to apply on compromises on old orders with a local mill, though this mill is understood to be refusing all shipments at the present time. These shipments involve heavy melting steel and hydraulic compressed. A small Canadian demand for No. 1 cast scrap exists, but local dealers are not willing to accept the Canadian offers; so transactions are light. Gray iron foundries are nearly all idle and steel castings plants report no business, thereby dropping out of the market for old material. Production is falling off in proportion to the lack of demand.

Warehouse Prices.—Business is quiet with sheets about as active as anything on the list. Demand for structural shapes is only fair, but sellers are encouraged because of the mill reduction. Prices carried are on the basis of the originally-announced mill quotations, and until definite announcement is made of any mill price readjustment, the warehouse prices will probably remain as at present.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel	$14.00 to $15.00
Low phos., 0.04 and under	17.00 to 18.00
No. 1 railroad wrought	12.00 to 13.00
Car wheels	17.50 to 18.00
Machine shop turnings	10.00 to 10.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	13.00 to 13.50
Stove plate	15.00 to 15.50
Grate bars	14.50 to 15.00
Bundled sheets	8.00 to 9.00
Hydraulic compressed	13.50 to 14.00
Railroad malleable	19.00 to 19.50
No. 1 machinery cast	16.50 to 17.50

Boston

Buffalo Furnaces Continue to Take Bulk of Pig Iron Business

BOSTON, May 27.—Buffalo furnaces continue to take the bulk of passing pig iron business in this territory, sales of which the past week aggregated several thousand tons. Prices on Buffalo iron are weak, but as far as can be ascertained have not fallen below $19.50 furnace base. Differentials on No. 2X and No. 1X iron, however, generally are ignored or greatly modified, which accounts in a large measure for the comparatively large Buffalo sales. Indications are the Buffalo iron situation will shortly change, for one of the largest pig iron producers is to blow out two furnaces, and activities of other furnace interests in that territory are understood to be falling off rather rapidly. The largest inquiry the past week was one for 1500 tons No. 2X and No. 1X, June and July delivery iron, from a Providence, R. I., melter. The business will be split three ways, 750 tons No. 2X going to a Buffalo furnace at $19.50 furnace, while the No. 1X will go to Pennsylvania and Buffalo furnaces at $20. Pennsylvania No. 2 plain can still be done at $21 furnace, but only on round tonnages. The general base price on Pennsylvania iron is $21.50, with a few furnaces asking $22. Most of the iron purchased today is on speculation, inasmuch as New England foundries as a whole are less active than heretofore. Importations the past week were 235 tons of Scotch iron, which compares with 500 tons Dutch the previous week. Both lots have been sold, but price details are lacking.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$25.15 to $26.15
East. Penn., sil. 1.75 to 2.25	24.65 to 25.65
Buffalo, sil. 2.25 to 2.75	24.41 to 25.41
Buffalo, sil. 1.75 to 2.25	24.41 to 24.91
Virginia, sil. 2.25 to 2.75	31.42 to 32.42
Virginia, sil. 1.75 to 2.25	30.92 to 31.92
Alabama, sil. 2.25 to 2.75	32.10 to 33.10
Alabama, sil. 1.75 to 2.25	31.60 to 32.60

Finished Materials.—Buying of all mill products is quiet, with prices unsettled. Plates have sold in a small way at 2c. Pittsburgh, a new low price for this move-

ment. The Providence Water Supply Board, Providence, R. I., is in the market for 1330 tons of plates for a pipe line at Hope, R. I. Structural shapes generally are 2.25c. Pittsburgh, but less can be done on large tonnages. Wire nails are offered at concessions of 10c. a keg. Mills are reported as voluntarily reducing prices on all material contracted for at higher prices than prevail today. Warehouse prices remain unchanged notwithstanding the reductions made by mills. The movement of iron and steel out of warehouses in the aggregate is of fairly good volume, but individual orders call for small amounts of stock.

Soft steel bars, $3.51½ per 100 lb. base; flats, $4.40; plain and deformed concrete bars, $3.76½; small angles, channels and tees, $3.51½; structural steel, large angles and beams, $3.61½; tire steel, $4.80 to $5.15; open-hearth spring steel, $5 to $8; crucible spring steel, $12; steel bands, $4.31½ to $5.20; hoops steel, $5.80 to $6.30; cold rolled steel, $4.35 to $4.85; toe calk steel, $6.15; heavy plates, $3.61½; light plates, $3.86½; diamond pattern plates, stock sizes, $5.90; blue annealed sheets, $4.51½; refined iron bars, $3.51½; best refined iron bars, $4.75; Wayne, $5.50; Norway rounds, $6.60; Norway squares and flats, $7.10.

Coke.—Connellsville coke interests are more actively soliciting business in this territory than they have before in months. Business has been booked in Connecticut and western New England at around $11 delivered or $1 a ton under prices quoted by New England by-product coke producers. Bookings are comparatively small, however, because foundries are well covered for the rest of the year. The movement of by-product fuel from ovens to foundries has slowed down materially, due to a car shortage caused by unusually heavy discharging of coal at the New England Coal & Coke Co.'s Everett plant.

Old Material.—Although further recessions in prices are reported, sentiment in the old material market is more cheerful and business somewhat more active. Trading is still limited, however, because of the unwillingness of scrap owners to sell at prevailing quotations. The American Steel & Wire Co., Worcester, Mass., during the past week inquired for 1000 tons low phosphorus steel scrap on a basis of around $21 delivered, but has not closed. The company has, however, purchased heavy melting steel at around $13.50 delivered. Embargoes against shipments to Sparrows Point continue to check business. Mill wrought, equivalent to yard wrought, at $12 on cars, steel turnings at $7, and chemical borings at $8, $8.50 and a few at $9, figure in recent transactions. Aside from a car of No. 1 textile machinery cast here and there, New England melters are not interested in old material except from what they can pick up at local or nearby yards.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$20.50 to $21.00
No. 2 machinery cast	17.50 to 18.00
Stove plates	15.00 to 15.50
Railroad malleable	15.50 to 16.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.00 to $10.50
No. 1 railroad wrought	12.50 to 13.00
No. 1 yard wrought	11.50 to 12.00
Wrought pipe (1-in. in diam., over 2 ft. long)	9.50 to 9.75
Machine shop turnings	6.50 to 7.00
Cast iron borings, chemical	8.50 to 9.00
Cast iron borings, rolling mill	7.00 to 7.50
Blast furnace borings and turnings	6.50 to 7.00
Forged scrap and bundled skeleton	7.00 to 7.50
Shafting	15.00 to 15.50
Street car axles	15.00 to 15.50
Rails for rolling	11.00 to 11.50

Cincinnati

Ironton Iron Declines to $21 Furnace—Coke and Scrap Dull

CINCINNATI, May 27.—Continued weakness in Northern irons was reflected in a sale of 400 tons of southern Ohio iron at $21, Ironton base, and several hundred tons of off grade iron at slightly under this figure. Another sale of 500 tons at $21, Ironton, was reported, while a Lake front furnace sold 300 tons in this territory at a delivered price to figure slightly below $21, Ironton. The Southern market is now established at $21, though one or two furnaces have not reduced from $22. There is little activity. The Worthington Pump & Machinery Corporation is in the market for approximately 1200 tons of foundry, Bessemer and charcoal irons, and the Louisville & Nashville Railroad is inquiring for 150 tons of Southern. Carload inquiries for silveries constitute current activity, and prices are unchanged on business being booked. Some foundries report a slight increase in the melt, while others are curtailing operations, leaving the general average about the same as has been reported for some weeks.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$25.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	25.55
Ohio silvery, 8 per cent	32.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	23.27
Basic Northern	23.27
Malleable	23.27

Sheets.—A wide range of prices is current, some offerings of black sheets at 3.50c. being reported. But for general business the market can be quoted at 2.80c., 3.60c. and 4.75c. for blue annealed, black and galvanized sheets respectively. Demand runs largely to carload lots for fill-in purposes.

Structural Activity.—A number of small inquiries are current. There were no lettings of importance. Some fabricators are in the market for plain material for jobs taken recently.

Reinforcing Bars.—Business is more in prospect than actually current, although there has been some inquiry during the week, mostly for small tonnages. Prices are about the same as last week, the range being from 2c. for rail steel bars to 2.25c. for new steel.

Warehouse Business.—Small orders for quick shipment are still fairly numerous, but the market lacks snap. There has been no change in prices.

Finished Materials.—The market is very dull, and prices show little tendency to change on the small amount of business offering. Competition is keen, however, for orders, and it is probable that current prices would not hold on attractive tonnages. Bars, shapes and plates are in light demand, and quotations are being adhered to, namely 2.25c., Pittsburgh. Wire products are moving in slightly improved volume, but the aggregate tonnage is still very small. The common quotation on wire nails is $2.90 per keg, but it is said that some mills are allowing Ironton River freight rate of 15c. per keg for shipment into this district. Manufactured wire is in improved demand, though this can hardly be said to mean very much, as business to date has been very poor. Bolts and nuts are spotty, with prices fluctuating over a wide range. Light rails and track accessories are very quiet.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.25c.; cold-rolled flats, squares and hexagons, 4.75c.; open-hearth spring steel, 5c. to 6c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, 4.80c.; No. 28 galvanized sheets, 5.85c.; No. 9 annealed wire, 3.60c.; common wire nails, $3.40 per keg base; cement coated nails, $3 per keg.

Old Material.—There is little consumer buying of scrap, although some dealers are still buying materials to lay down on yards, figuring that prices cannot go much lower, and that any change will be upward. In view of the prevailing inactivity, prices quoted below are largely nominal.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

	Per Gross Ton	
Heavy melting steel	$11.00 to	$11.50
Scrap rails for melting	10.50 to	11.00
Short rails	15.50 to	16.00
Relaying rails	27.00 to	27.50
Rails for rolling	12.50 to	13.00
Old car wheels	11.50 to	12.00
No. 1 locomotive tires	12.50 to	13.00
Railroad malleable	13.50 to	14.00
Agricultural malleable	12.50 to	13.00
Loose sheet clippings	7.00 to	7.50
Champion bundled sheets	9.00 to	9.50
Per Net Ton		
Cast iron borings	7.50 to	8.00
Machine shop turnings	6.50 to	7.00
No. 1 machinery cast	16.50 to	17.00
No. 1 railroad cast	13.00 to	13.50
Iron axles	19.50 to	20.00
No. 1 railroad wrought	9.00 to	9.50
Pipes and flues	6.00 to	6.50
No. 1 busheling	7.50 to	8.00
Mixed busheling	5.00 to	5.50
Burnt cast	9.00 to	9.50
Stove plate	9.00 to	9.50
Brake shoes	10.00 to	10.50

Coke.—The coke market is dull as regards foundry grades. A Missouri gas company placed an order for 12,000 tons of by-product coke for delivery during the last half of the year. By-product producers in this territory have announced that there will be no change in foundry coke prices for June shipment, $7.50, Connellsville basis, being reaffirmed. Prices from other districts also are unchanged from last week.

Connellsville furnace, $3.25; foundry, $4.75; New River foundry, $9 to $10; Wise County furnace, $4; foundry, $4.75; by-product foundry, $7.50, Connellsville basis.

Birmingham

Lower Pig Iron Prices Fail to Develop More Business

BIRMINGHAM, ALA., May 27.—Southern furnace interests have concluded that lower prices will not encourage buying, as melters are determined to place orders for the product just as their needs present. The $21 base, No. 2 foundry, failed to bring out any active buying. The recession in quotations is admitted, the more active and larger producers asserting that $22 is the price, but the $21 quotation is a fact. There have been some holding up on delivery instructions lately. The aggregate iron moving, however, is still above the amount being produced. Sloss-Sheffield Steel & Iron Co., with a freight differential by water and rail into the Middle West, has been shipping its product steadily. Other interests have been receiving some small lot orders from the Central West, including Ohio points, for one and two cars of iron, the product being used a mixture. The Gulf States Steel Co. has three of its six open furnaces at the steel works in Gadsden in operation again and is requiring a little more basic iron.

We quote per gross ton f.o.b. Birmingham district furnace as follows:

No. 1 foundry, 2.25 to 2.75 sil	$21.50
No. 2 foundry, 1.75 to 2.75 sil	21.00
Basic	21.50
Charcoal, warm blast	31.00

Cast Iron Pipe.—No hesitation is noted in the operations at the cast iron pipe plants of this section, so far as pressure pipe, the larger sized, is concerned. Lettings are still reported, but not in the quantity that was noted a few weeks ago. The plants are producing steadily and shipping about as quickly as the pipe comes out. The American Cast Iron Pipe Co. announces orders as follows: Fort Worth, Tex., 185 tons; Memphis, 110 tons; Laurinburg, N. C., 126 tons; Greeneville, Tenn., 490 tons.

We quote class B, 4-in. water, $52 to $53; 6-in. and over, $48 to $49; class A, $5 higher; standard soil pipe, $60; heavy gage, $45; standard fittings, $110.

Structural Steel and Concrete Bars.—The local demand for structural steel furnishes the small fabricators with some trade as well as the larger industries in this line. Several contracts are being worked on by the Ingalls Iron Works Co. and the Virginia Bridge & Iron Co., the larger plants in structural steel, the latter company pushing the work on the steel for the several buildings which will comprise the Southern Railway Finley shops development. The rolling mills of the Southern Steel & Rolling Mills, Inc., producing concrete bars is losing but little time with one shift a day, contracts being received from every direction. The Connors Steel Co., on cotton ties, hoops and bands, is operating at about 60 per cent. Steel bars are quoted 2.40c., Birmingham.

Coke.—By-product coke oven plants are producing almost to capacity, while no decrease is reported in the beehive operations. Quotations continue around $6 for foundry coke. Uncertainty obtains by reason of the slowing down of soil pipe and fittings plants in this district.

Scrap Iron and Steel.—Weaker quotations are seen in the Birmingham district in scrap iron and steel with the exception of stove plate and No. 1 cast. Heavy melting steel is dormant. The cast iron pipe interests are the best customers in old material. Dealers are keeping stocks to average state, buying in about the same amount as they are shipping. The little old material moving now will continue at the same pace for a few weeks at least.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	13.50 to 14.00
Railroad wrought	11.50 to 12.00
Steel axles	17.00 to 18.00
Iron axles	20.00 to 20.50
Steel rails	13.00 to 14.00
No. 1 cast	18.50 to 19.00
Tram car wheels	17.00 to 18.00
Car wheels	16.00 to 17.00
Stove plate	15.50 to 16.50
Machine shop turnings	7.00 to 8.00
Cast iron borings	7.50 to 8.50
Rails for rolling	15.50 to 16.00

St. Louis

More Interest Shown by Pig Iron Melters, but Sales Are Small

ST. LOUIS, May 27.—The largest sales of the week were made by a Southern maker, a total of 900 tons to three East Side melters and 100 tons to a St. Louis concern. The St. Louis Coke & Iron Co. sold a total of 300 tons in carload lots for prompt shipment. While inquiries now amount to very little, greater interest is being shown in the market by melters, and there is a feeling by makers that there will be some buying with the beginning of the third quarter. This feeling of optimism is based largely on the fact that there has been very little buying up to now and the belief that melters must purchase soon. The price of pig iron and general business conditions will determine whether there will be any more than the hand-to-mouth buying that has prevailed for some time. Southern iron is quoted at $21, Birmingham; Northern at $22, Chicago, and Granite City at $23 to $23.50, furnace, but these quotations are nominal.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 31c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$24.16 to $25.16
Northern malleable, sil. 1.75 to 2.25	24.16 to 25.16
Basic	24.16 to 25.16
Southern fdy., sil. 1.75 to 2.25 (rail)	26.17
Southern foundry, sil. 1.75 to 2.25 (rail and water)	24.28
Granite City iron, sil. 1.75 to 2.25	23.81 to 24.81

Finished Iron and Steel.—The award of the sheet piling—2100 tons—for the municipal water works plant has been made by the general contractor, the Frazier-Davis Construction Co., to Bethlehem Steel Co. The specifications called for either Carnegie Steel Co. or Bethlehem Steel Co. material. Some small orders have been placed for blue annealed sheets, but there is no demand for galvanized and black sheets. A few scattering orders have been received by mills for plates, shapes and bars. Railroad inquiries have been confined to a few spikes.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled, one pass, 5c.; cold rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets, ⅞-in. and smaller, 60 per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40-5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagon, blank or tapped, $3.50 off list.

Coke.—Local by-product concerns have been doing a small business in foundry grades, but there is no business at all in domestic grades.

Old Material.—What little activity there is in old material is confined to dealers who are buying specialties to fill a contract for an East Side consumer. In some items, where there are short interests, a little strength has been shown. This is a temporary situation, and the market generally may be said to be as weak as it has been at any time in the last few months, especially as there is no new business in sight. New lists include: Dodge Brothers, Detroit, 5000 tons; Chi-

cago, Burlington & Quincy Railroad, 6000 tons, and the New York Central, blind list.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$12.00 to $12.50
Rails for rolling	14.00 to 14.50
Steel rails less than 3 ft.	15.00 to 15.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	14.00 to 14.50
Heavy melting steel	12.50 to 13.00
Heavy shoveling steel	12.50 to 13.00
Frogs, switches and guards cut apart	13.00 to 13.50
Railroad springs	15.75 to 16.25
Heavy axles and tire turnings	10.00 to 10.50
No. 1 locomotive tires	14.50 to 15.00
Per Net Ton	
Steel angle bars	12.50 to 13.00
Steel car axles	15.00 to 15.50
Iron car axles	21.00 to 21.50
Wrought iron bars and transoms	15.50 to 16.00
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	11.00 to 11.50
Cast iron borings	7.50 to 8.00
No. 1 busheling	10.25 to 10.75
No. 1 railroad cast	16.00 to 16.50
No. 1 machinery cast	17.50 to 18.00
Railroad malleable	13.50 to 14.00
Machine shop turnings	5.50 to 6.00
Champion bundled sheets	7.50 to 8.00

Cleveland

Little Demand for Steel—Automobile Companies Still Curtailing

CLEVELAND, May 27.—The demand for steel continues very light, with virtually no change in the tonnage booked as compared with the previous few weeks. One large producer reports that its orders during the week were for somewhat larger lots than recently. However, the bulk of business that is being booked is for not over car lots. Steel mills in this territory are operating on an average close to 60 per cent, or about the same as during the past few weeks. One producer has increased its plate and sheet production to take care of an accumulation of orders and will keep at the increased schedule about two weeks. The average of wire mill operations is about 50 per cent. There has been further slowing down by bolt and nut manufacturers and other metal working plants and mills are unable to secure specifications from some of their trade having contracts. While an improvement in automobile production is predicted for next month, there are as yet no signs of any increased demand for steel from motor car builders or parts manufacturers, and in fact the tendency in the automotive field is still toward further curtailment. Consequently, the demand from that source is very light, although an Ohio forge shop is inquiring for 800 tons of bars for automobile work. Alloy steel producers have got down to about 40 per cent of capacity. In the structural field there is still a moderate volume of activity. The American Locomotive Works has placed with a Cleveland mill all or the greater part of 3500 tons of plates for 100 locomotives for the Chesapeake & Ohio Railroad. These are understood to have brought a very low price in competition with the Eastern mills. Plates in this territory are softer, sales having been made at 2.15c., although some mills are still holding to 2.25c.; others seem more inclined to quote 2.20c. Local plate mills are finding it increasingly difficult to secure business in the West because of the competition of Chicago mills, which are reported to have gone close to 2.25c. for business in competitive territories. Steel bars and structural material are holding firmly to 2.25c. There is no life in the strip steel market and prices are very irregular with wide strip not above 2.50c. Cold-rolled strip lacks firmness at 4.50c.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 28 black sheets, 4.55c. to 4.65c.; No. 28 galvanized sheets, 5.65c.; No. 10 blue annealed sheets, 3.65c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.66c.; No. 9 annealed wire, $3.30 per 100 lb.; No. 9 galvanized wire, $3.75 per 100 lb.; common wire nails, $3.40 base per 100 lb.

Pig Iron.—The market shows more life than for several weeks, but more interest is being taken in third quarter and last half contracts than in actual business. However, sales increased slightly as compared with the previous week, but little of the business came from this immediate territory. One producer reports several sales of foundry and malleable iron aggregating 5000 tons and has inquiries for 12,000 to 15,000 tons, including one for 5000 tons. Several Eastern inquiries have reached the local market. Some consumers that have not yet sent out inquiries have advised furnaces that they will buy iron during June for the next quarter. No new life is developing in the foundry end of the automobile industry and neither inquiries nor releases of old inquiries are coming from that source. The market still lacks strength. Lake furnaces have so far held to $21 for foundry and malleable iron, at which sales were made during the week, but it is reported that $20 has been quoted in the Valley district on an attractive inquiry, although the common asking price is $20.50 to $21. Locally the market is settling down to $22 at furnace for Cleveland delivery, or at the reduction noted last week, although $22.50 is still being asked for car lots. It has developed that the 3000 tons of malleable iron purchased by the Link Belt Co. for its Indianapolis plant went at around $22.50 delivered. Lake furnaces deny taking this business and local sellers are inclined to believe that it went to the Ironton district. Several inquiries are pending for small lots of low phosphorus iron, on which $28.50 appears to be no longer more than a nominal quotation.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$20.00 to $21.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	22.50 to 23.00
Southern fdy., sil. 1.75 to 2.25	27.00
Malleable	22.50 to 23.00
Ohio silvery, 8 per cent	33.52
Stand. low phos., Valley furn.	28.00 to 28.50

Iron Ore.—The market continues virtually at a standstill. There have been very few open market sales so far outside of small lots that furnaces bought for early requirements and sellers see nothing in the present situation to indicate much activity in the near future.

Bolts, Nuts and Rivets.—Less price cutting is reported on bolts and nuts than recently, as there appears to be more of a disposition among manufacturers to hold to the regular price schedule represented by 60, 10 and 10 per cent off list for large machine bolts. Some of the manufacturers report an improvement in small lot orders. The rivet market continues slow and irregular. While some makers are going to 2.65c., orders are being received on contracts placed at 2.75c.

Semi-Finished Steel.—Specifications for sheet bars continue very light. Shipments on contracts taken at higher prices are being made at $40, which is regarded as the present market price. The demand for slabs, which are commonly quoted at $38, has been curtailed materially because of a limited operation of strip and plate mills. The leading local producer is still operating eight out of 13 open-hearth furnaces.

Sheets.—There is no improvement in the demand, which continues very light. There has been a further curtailment in production and the present average operation by Ohio mills is estimated at under 50 per cent. Black sheets are very weak and can be bought in small quantities at 3.50c., although some of the mills feel that low prices will not stimulate sales and are holding to 3.65c. Blue annealed sheets are unchanged at 2.75c. to 2.80c., and galvanized sheets at 4.80c.

Coke.—No change has developed in the foundry coke market. Prices on standard Connellsville coke still range from $4.75 to $6, with the demand very light.

Wire Products.—The nail and wire market is very dull and 2.90c. on rails and 2.65c. on plain wire have become common quotations, with reports of 2.60c. on the latter. Cleveland jobbers have reduced nails 20c. per keg and wire $4 per ton.

Old Material.—With virtually no buying by consumers two factors are holding up prices. One is the decline in production and the other is that considerable scrap is being laid down by dealers. With the reduced output the demand from consumers, together with the volume of buying for yard stocks, apparently is in ex-

cess of production. Producers also appear indifferent about selling scrap at present prices. The market is firm, with prices slightly higher on borings and turnings and a few other grades. There is a fair demand for borings and turnings for delivery to local mills and these are bringing $11.50. One lot was purchased by a consumer at that price.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$14.00
Rails for rolling	$15.50 to 16.00
Rails under 3 ft	16.25 to 16.75
Low phosphorus melting	16.50 to 16.75
Cast iron borings	12.00 to 12.25
Machine shop turnings	11.00 to 11.25
Mixed borings and short turnings	12.00 to 12.25
Compressed sheet steel	12.00 to 12.25
Railroad wrought	12.00 to 12.25
Railroad malleable	17.50 to 18.00
Light bundled sheet stampings	11.50 to 12.00
Steel axle turnings	12.00 to 12.50
No. 1 cast	20.00 to 20.50
No. 1 busheling	10.25 to 10.50
Drop forge flashings	9.00 to 9.25
Railroad grate bars	13.25 to 13.50
Stove plate	13.25 to 13.50
Pipes and flues	9.25 to 9.50

Philadelphia

Slightly More Interest in Pig Iron—Scrap Moves Up from Low Levels

PHILADELPHIA, May 27.—Continued moderate buying of steel products, with more pronounced weakness in plates and shapes; more business in pig iron, but at lower prices, and a slight increase in the demand for some grades of scrap, with several price advances, are the only things which can be pointed to as indicating any new trends in the market.

Probably the better demand for pig iron and the upturn in the scrap market are too small to be of any significance, but they are the most hopeful signs in the market this week. The increased volume of pig iron buying has been stimulated by lower prices, sales of foundry grades having been made below $21, furnace.

Pig Iron.—With large stocks of pig iron still on hand in furnace yards and with consumption undoubtedly decreasing, no special importance can be attached to a moderate increase in sales in the past week. Moreover, many of these sales have been brought about by concessions on the part of two or three furnaces. Foundry iron of the base grade has been sold at about $20.50, furnace, and No. 2X at $21. Open quotations of two or possibly three sellers are $21, base, and on fair-size lots this price can be shaded. Furnaces are divided into two groups, those which are selling at $21 or less and those which adhere firmly to a basis of $23, furnace. Three selling interests are in the latter class, their attitude being due largely to the fact that they are not sufficiently in need of orders to meet the current low prices. Malleable iron is quoted at $21.50 to $22, furnace. Low phosphorus iron, both copper free and copper bearing, is obtainable at $24 to $25, furnace. Although there have been no recent sales of basic iron, quotations of $21, delivered, are reported to have been made.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.90 to $23.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.40 to 23.63
East. Pa. No. 1X	22.90 to 24.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	30.17 to 31.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.67 to 31.67
Basic delivered eastern Pa.	21.00 to 21.50
Gray forge	22.00 to 22.50
Malleable	22.50 to 23.50
Standard low phos. (f.o.b. furnace)	24.00 to 25.00
Copper bearing low phos. (f.o.b. furnace)	24.00 to 25.00

Billets.—Moderate sales of billets have been made at $38, Pittsburgh, for rerolling quality and $43 for forging quality.

Plates.—Keener competition has developed in plates. Eastern mills quoted 1.90c. and 2c., Pittsburgh, on 3500 tons bought by a locomotive company, the order going to an Ohio mill at a lower figure. On ordinary lots of a carload or 100 tons, Eastern mills now quote 2c., Pittsburgh, and 2.10c. seems to be the top of the market, applying on very small lots. The most interesting development of the week is the inquiry of the Chesapeake & Ohio Railroad for 11,000 tons of steel, mostly plates, for 1000 cars to be built for that road by the Newport News Shipbuilding & Dry Dock Co The material for all of the other cars ordered several weeks ago by the Chesapeake & Ohio was bought by the car builders to whom the orders were awarded, and the decision of the railroad to buy steel for the Newport News company came as a surprise to the steel trade.

Structural Steel.—With the exception of 2000 tons of fabricated steel for the approaches to the new Philadelphia-Camden bridge, on which bids close early in June, the local trade is figuring mostly on small jobs, and there is unusually keen competition. Fabricators are in many instances sacrificing profits to keep their shops busy. Plain material prices range from 2.10c. to 2.20c., Pittsburgh, but the lower figure has been shaded in some transactions. Plans for the first section of the new Philadelphia subways will be submitted for bids in about 30 days. The first section will take about 8000 tons of steel, but the whole undertaking will require upward of 50,000 tons.

Bars.—Merchant steel bars are firmly quoted, at least by the larger producers, at 2.25c., Pittsburgh, but concrete bars are being sold at 2.20c.

Warehouse Business.—Prices quoted by local jobbers on steel out of stock show considerable variation. Bars, for example, are being sold at prices ranging from 3.10c. to 3.47c. and some other products exhibit the same irregularities.

Imports.—Two lots of manganese ore were received here last week, one of 3670 tons from British Africa and one of 1500 tons from Calcutta, India. British India shipped in 1500 tons of chrome ore. Steel imports consisted only of 261 tons of beams from Belgium and 22 tons of channels from Belgium.

Old Material.—Without any marked increase in demand, the scrap market has taken a slight upward turn, the advances being due to consumers' need of certain grades and their inability to buy sufficient quantities at the low prices which have been in effect in recent weeks. Advances of 50c. a ton in heavy cast scrap, cast iron borings and bundled sheets are due to higher prices offered by a central Pennsylvania mill. Railroad grate bars, stove plate, pipe and shafting are also higher. Two or three mills are freely offering $15, delivered, for No. 1 heavy melting steel and are getting only carload lots. Dealers who are paying $15 a ton for steel scrap to be stored in their yards say that they would not consider making a sale of a tonnage at less than $16, and of course they would not sell stored scrap at that figure, as some of it that has been put away will have to sell at $18 to yield a profit.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00
Scrap rails	15.00
Steel rails for rolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	19.00 to 20.00
Couplers and knuckles	18.00 to 18.50
Cast-iron car wheels	17.00 to 17.50
Rolled steel wheels	18.00 to 18.50
No. 1 railroad wrought	16.50 to 17.00
No. 1 yard wrought	16.00 to 16.50
No. 1 forge fire	12.50 to 13.00
Bundled sheets (for steel works)	11.50 to 12.00
Mixed borings and turnings (for blast furnace use)	11.00 to 11.50
Machine shop turnings (for steel works use)	12.00
Machine shop turnings (for rolling mill use)	12.00 to 12.50
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mills)	12.50 to 13.00
Cast borings (for chemical plants)	13.50 to 14.50
No. 1 cast	17.00 to 17.50
Heavy breakable cast (for steel plants)	15.00 to 15.50
Railroad grate bars	14.00 to 14.50
Stove plate (for steel plant use)	14.00 to 14.50
Wrought iron and soft steel pipes and tubes (new specifications)	15.00
Shafting	20.00 to 21.00
Steel axles	19.00 to 20.00

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....2.20c. to 2.25c.

Structural Materials

Beams, channels, etc., base, per lb.....2.20c. to 2.25c.
Sheet piling .....2.30c. to 2.40c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.20c. to 2.25c.
Soft steel bars for cold finishing.....$3 per ton over base
Reinforcing steel bars, base.....2.20c. to 2.25c.
Refined iron bars, base, per lb.....3c.
Double refined iron bars, base, per lb.....4.75c.
Stay bolt iron bars, base, per lb.....6.50c. to 7.00c.

Hot-Rolled Flats

Hoops, base, per lb.....2.75c. to 2.90c.
Bands, base, per lb.....2.75c. to 2.90c.
Strips, base, per lb.....2.75c.

Cold-Finished Steel

Bars and shafting, base, per lb.....2.90c. to 3.00c.
Bars and shafting, l.c.l., per lb.....3.25c.
Bars, S. A. E. Series, No. 2100.....4.75c.
Bars, S. A. E. Series, No. 2300.....6.25c.
Bars, S. A. E. Series, No. 3100.....5.25c.
Strips, base, per lb.....4.50c.

Wire Products

(To jobbers in car lots)

Nails, base, per keg.....$2.90
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.....$2.65
Annealed fence wire, base, per 100 lb..... 2.80
Spring wire, base, per 100 lb..... 3.70
Galvanized wire No. 9, base, per 100 lb..... 3.25
Galvanized barbed, base, per 100 lb..... 3.70
Galvanized staples, base, per keg..... 3.70
Painted barbed wire, base, per 100 lb..... 3.35
Polished staples, base, per keg..... 3.35
Cement coated nails, base, per count keg..... 2.40
Bale ties, carloads to jobbers.....75 and 2½ per cent off list
Woven fence, carloads (to jobbers).....67½ per cent off list
Woven fence, carloads (to retailers).....65 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads,
60, 10, 10 and 10 per cent off list
Machine bolts, all sizes, cut threads,
60, 10 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads,
60, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes...60 and 10 per cent off list
Lag bolts .....65, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.,
50, 10 and 10 per cent off list
Larger and longer sizes.....50, 10 and 10 per cent off list
Hot pressed squares or hex. nuts, blank....4.75c. to 5c. off list
Hot pressed nuts, tapped.....4.75c. to 5c. off list
C.p.c. and t. square or hex. nuts, blank.....4.25c. to 4.50c.
C.p.c. and t. square or hex nuts, tapped.....4.25c. to 4.50c.
Semi-finished hex. nuts:
⅞ in. and smaller, U. S. S.....80, 10 and 5 per cent off list
⅞ in. and larger, U. S. S.....75 and 10 per cent off list
Small sizes, S. A. E.....80, 10, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75, 10 and 5 per cent off list
Stove bolts in packages.....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10, 5 and 2½ per cent off list
Tire bolts .....60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 5 per cent off list
Bolt ends with cold pressed nuts.....50 and 5 per cent off list
Turnbuckles, with ends, ½ in. and smaller,
55 and 5 per cent off list
Turnbuckles, without ends, ½ in. and smaller,
70 and 10 per cent off list
Washers .....5.75c. to 6.00c.
Lock washers .....80 per cent off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

	Per 1000 S. A. E.	Per 1000 U. S. S.		Per 1000 S. A. E.	Per 1000 U. S. S.
¼-in.	$4.25	$4.25	⅞-in.	$13.25	$13.50
5/16-in.	4.90	4.90	15/16-in.	16.25	16.50
⅜-in.	5.90	6.25	⅞-in.	22.50	23.00
7/16-in.	7.50	8.50	1⅛-in.	34.00	34.00
½-in.	9.75	10.00	1-in.	53.00	55.00

Larger sizes—Prices on application.

Cap and Set Screws

Milled hex. head cap screws.....75, 10 and 5 per cent off list
Milled standard set screws, case hardened,
75, 10 and 5 per cent off list
Milled headless set screws, cut thread,
75, 10 and 5 per cent off list
Upset hex. head cap screws, U. S. S. thread,
80, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread,
80, 10 and 10 per cent off list
Milled studs .....65 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb..$2.65 to $2.75
Small rivets .....70 and 10 per cent off list

Track Equipment

Spikes, ⅝ in. and larger, base, per 100 lb.....$2.90 to $3.00
Spikes, ½ in. and smaller, base, per 100 lb.... 3.25 to 3.40
Spikes, boat and barge, base, per 100 lb..... 3.25 to 3.40
Track bolts, all sizes, base, per 100 lb..... 3.75 to 4.25
Tie plates, per 100 lb..... 2.55
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	3
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3	61	50½
¼ to ⅜	47	30½	¼ to ⅜	+19	+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½	60	49½	1 to 1¼	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2½ to 4	57	46¼	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.	27	1½ in.	+13
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	55	3 and 3¼ in.	36
1¼ and 1½ in.	47	3½ and 3¾ in.	37
1¾ in.	31	4 in.	41
2 and 2¼ in.	22	4½ in. and 5 in.	33
2½ and 2¾ in.	32		

Hot Rolled			
3 and 3¼ in.	38	4 in.	43
3½ in. and 3¾ in.	39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....85 per cent off list
Carbon 0.30 to 0.40, base.....83 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage	15	2¼-in. O.D. 10 gage	20
2-in. O.D. 11 gage	16	3-in. O.D. 7 gage	35
2-in. O.D. 10 gage	17	1½-in. O.D. 9 gage	15
2¼-in. O.D. 12 gage	17	5⅜-in. O.D. 9 gage	55
2¼-in. O.D. 11 gage	18	5½-in. O.D. 9 gage	57

Tin Plate

Standard cokes, per base box.....$5.50

Terne Plate

(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.00	20-lb. coating I. C.	$14.90
8-lb. coating I. C.	11.30	25-lb. coating I. C.	16.20
12-lb. coating I. C.	12.70	30-lb. coating I. C.	17.35
15-lb. coating I. C.	13.95	35-lb. coating I. C.	18.35
		40-lb. coating I. C.	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.80c. to 3c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.50c. to 3.85c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb., 5.10c.

Galvanized

No. 28 (base), per lb.....4.75c. to 5c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.85c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.65
Old range non-Bessemer, 51½ per cent iron	4.90
Mesabi Bessemer, 55 per cent iron	5.40
Mesabi non-Bessemer, 51½ per cent iron	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.75c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	45c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	42c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.75 to $10.00
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	19.00 to 22.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$107.50
Ferromanganese, British, 80 per cent f.o.b. Atlantic port, duty paid	107.50
Ferrosilicon, 50 per cent, delivered	75.00
Ferrosilicon, 75 per cent	140.00
Ferrotungsten, per lb. contained metal	90c. to 93c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	10.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent, $36.00 to $37.00
Spiegeleisen, domestic, 16 to 19 per cent, 35.00 to 36.00
Ferrosilicon, Bessemer, 10 per cent, $39.50; 11 per cent, $42, 12 per cent, $43.50; 14 to 16 per cent (electric furnace), $40.00.
Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $30.50; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines		$20.00 to $22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines		22.00 to 23.50
Per 1000 f.o.b. works:		
Fire Clay:	High Duty	Moderate Duty
Pennsylvania	$40.00 to $45.00	$37.00 to $40.00
Maryland	45.00 to 47.00	40.00 to 42.00
Ohio	40.00 to 43.00	37.00 to 39.00
Kentucky	42.00 to 43.00	37.00 to 39.00
Illinois	——	37.00 to 42.00
Missouri	42.00 to 45.00	35.00 to 40.00
Ground fire clay, per net ton		6.00 to 7.00
Silica Brick:		
Pennsylvania		38.00
Chicago		47.00
Birmingham		50.00
Ground silica clay, per net ton		7.50 to 8.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		47.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$38.00
Rolling billets, 2-in. and under	38.00
Forging billets, ordinary carbons	43.00
Sheet bars, Bessemer	40.00
Sheet bars, open-hearth	40.00
Slabs	38.00
Wire rods, common soft, base, No. 5 to ⅜-in.	$48.00 to 49.00
Wire rods, common soft, coarser than ⅜-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon, 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2.20c. to 2.25c.
Skelp, sheared, per lb.	2.20c. to 2.25c.
Skelp, universal, per lb.	2.20c. to 2.25c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton	$43.00
Rails, light, new steel, base, lb.	1.90c. to 2.00c.
Rails, light, rail steel, base, per lb.	1.85c. to 1.90c.
Bars, common iron, base, per lb., Chicago mill	2.30c.
Bars, common iron, Pittsburgh mill	2.40c.
Bars, rail steel reinforcing, base, per lb.	2.10c. to 2.15c.
Rail steel bars, base, per lb., Chicago mill	2.20c.
Cold-finished steel bars, base, Chicago, per lb.	2.90c. to 3c.
Ground shafting, base, per lb.	3.40c.
Cut nails, base, per keg	$3.00 to $3.10

Alloy Steel

S. A. E. Series Numbers	Bars 100 lb.
2100*(½% Nickel, 10 to 20 per cent Carbon)	$3.50
2300 (3½% Nickel)	5.00
2500 (5% Nickel)	$6.50 to 7.00
3100 (Nickel Chromium)	4.00
3200 (Nickel Chromium)	5.75 to 6.00
3300 (Nickel Chromium)	8.00 to 8.25
3400 (Nickel Chromium)	7.00 to 7.25
5100 (Chromium Steel)	3.75
5200*(Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.75 to 5.00
6100 (Chromium Vanadium spring steel)	4.50 to 4.75
9250 (Silicon Manganese spring steel)	3.75 to 4.00
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.75
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.50 to 4.75
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb., f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton prices for bars of same analysis. On smaller than 4 x 4-in. billets the net ton bar price applies.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb.:

Philadelphia, domestic	$0.32	Buffalo	$0.265	St. Louis	$0.43	*Pacific Coast	$1.15
Philadelphia, export	0.235	Cleveland	0.215	Kansas City	0.735	*Pac. Coast, ship plates	1.20
Baltimore, domestic	0.31	Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)	0.705	Birmingham	0.53
Baltimore, export	0.225	Detroit	0.29	St. Paul	0.60	Memphis	0.56
New York, domestic	0.34	Cincinnati	0.29	Omaha	0.735	Jacksonville, all rail	0.70
New York, export	0.255	Indianapolis	0.31	Omaha	0.705	Jacksonville, rail and water	0.415
Boston, domestic	0.365	Chicago	0.34	*Denver	1.15	New Orleans	0.67
Boston, export	0.255			†Denver (pipe)	1.17		

*Applies minimum carload 30,000 lb. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingots and muck bars, structural steel, common wire products, including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

FABRICATED STEEL BUSINESS

Awards and Inquiries in Smaller Volume and Jobs Are Mostly of Minor Size

A sharp falling off in the volume of structural steel is indicated by the projects awarded and pending during the past week, as reported to THE IRON AGE. The awards total only a little more than 15,000 tons and new work in the market totals to about the same figure. The largest job awarded was 3800 tons for a printing press plant in Chicago, while the most important new work being figured on is 4500 tons for shops at San Bernardino, Cal., for the Santa Fe Railroad.

Structural Steel Awards

High School of Commerce, New York, 1500 tons, to Lehigh Structural Steel Co.

Pennsylvania Railroad, bridge near Pittsburgh, 350 tons, to American Bridge Co.

Philadelphia & Reading Railroad, bridge, 160 tons, to McClintic-Marshall Co.

Boston & Maine Railroad, bridge, 120 tons, to McClintic-Marshall Co.

Central Railroad of New Jersey, bridge at Allentown, Pa., 300 tons, to Phoenix Bridge Co.

Apartment building, 850 Park Avenue, New York, 550 tons, to Post & McCord.

Apartment house, East Orange, N. J., 900 tons, to Hedden Iron Construction Co.

Firemen's Insurance Building, Newark, N. J., 1200 tons, to Hedden Iron Construction Co.

Bridge at Deal Lake, N. J., 400 tons, to Bethlehem Steel Co.

Buffalo Sintering Co., new plant, 250 tons, to Bancroft-Jones Corporation.

S. S. Kresge, store alterations, 100 tons, to R. S. McMannus Steel Corporation.

Hinde & Dauch Paper Co., Sandusky, Ohio, factory buildings, 100 tons to Fort Pitt Bridge Works.

Union Trust Building, Huntington, W. Va., 600 tons, to Lehigh Structural Steel Co.

Masonic Temple, Springfield, Ohio, 650 tons, to Massillon Structural & Bridge Co.

Bourne-Fuller Co., warehouse at Cincinnati, 400 tons, to Austin Engineering Co.

Magnolia Petroleum Corporation, 5 oil storage tanks for Texas location, 1000 tons, to unnamed fabricator.

Standard Oil Co. of Louisiana, oil storage tanks, 1400 tons, to Petroleum Iron Works.

W. F. Hall Printing Co., plant, Chicago, 3800 tons, to Illinois Steel Co., North works.

Carnegie Steel Co., coke handling plant, Mingo Junction, Ohio, 325 tons, to American Bridge Co.

French & Hecht, plant alterations, Davenport, Iowa, 150 tons, to Rochester Bridge Co.

Corpus Christi, Tex., lift bridge, 500 tons, to Wisconsin Bridge & Iron Co.

Ford Motor Co., additional sawmill unit at Iron Mountain, Mich., 400 tons, to Worden-Allen Co.

Adam, Meldrum & Anderson, department store, Buffalo, 600 tons, to Pittsburgh Bridge & Iron Co.

Poinsett Hotel, Greenville, S. C., 700 tons, to Carolina Steel & Iron Co.

Logan Trust Co. building, New Kensington, Pa., 130 tons, to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

State of Vermont, two highway bridges, 300 tons.

Fall River, Mass., bridge repairs, 225 tons.

Central Railroad of New Jersey, shop at Elizabethport, N. J., 250 tons.

Hospital, Pittsfield, Mass., 200 tons.

Chesapeake & Ohio Railroad, bridge at Clifton Forge, Va., 300 tons.

State of New Jersey, two highway bridges, 300 tons.

Philadelphia & Reading Railroad, bridge, 300 tons.

Highway bridge over Susquehanna River at Milton, Pa., 850 tons.

Hospital, Nyack, N. Y., 100 tons.

Malden Spinning & Dyeing Co., Malden, Mass., plant, 140 tons.

First National Bank building, Portsmouth, Ohio, 175 tons, bids being taken.

Westminster Building, Dayton, Ohio, 425 tons, bids being taken.

Pennsylvania Railroad, freight station for Cincinnati, Lebanon & Northern Railroad, Cincinnati, 200 tons, bids being taken at Pittsburgh.

Ford Motor Co., extension to Hamilton, Ohio, plant, 200 tons, general contract to F. K. Vaughan, steel to be bought direct.

State of North Carolina, highway bridges, 300 tons, bids in.

Hamilton County Commissioners, Hamilton, Ohio, highway bridge, 400 tons, bids close June 6.

Atchison, Topeka & Santa Fe, additional units for mechanical department, San Bernardino, Cal., 4500 tons.

Jonathan Building, Los Angeles, Cal., 1000 tons.

Miami Fort power station, Cincinnati, 3000 tons, Sargent & Lundy, Chicago, engineers.

Delaware River Bridge, Philadelphia to Camden, approaches, 2000 tons.

RAILROAD EQUIPMENT BUYING

Developments in business in the railroad equipment field include the following items:

The Canadian National Railways have placed 6 mail and baggage cars with the American Car & Foundry Co.

The Rock Island is inquiring for repairs on 250 refrigerator cars.

The Santa Fe has placed 20 baggage cars with the Pullman Co.

The Delaware, Lackawanna & Western is inquiring for 40 caboose cars.

The Phillips Petroleum Co. has placed 75 tank cars with the General American Car Co., in addition to the 125 reported awarded to that company last week.

The Florida East Coast has ordered 200 box cars and 20 caboose cars from the Mount Vernon Car & Mfg. Co.

The Gary Tube Co. has placed 30 skelp cars with the Pressed Steel Car Co.

The Florida East Coast has ordered 3 passenger coaches from the Pullman Co.

Colored Aluminum Non-corrosive—Condenser Tubes

A method of protecting aluminum from the action of sea water, especially under conditions in which the metal is liable to be alternately wet and dry, is exhibited in the booth of the Institute of Metals at the British Empire Exhibition in Wembley, England. What is described as a remarkable series of specimens of aluminum protected by this method is shown. A means has been found whereby aluminum can be rendered not only resistant to corrosion, but can also at the same time be colored, thus making it particularly suited for decorative purposes. The possibilities of this new process are believed to be extensive. Colored aluminum in thin sheets is described as being possible for use in place of wall paper which would last for years and which could be washed down to an unlimited extent. Similarly colored aluminum paneling can be used in the construction of motor car bodies, replacing material that has to be painted.

There is also a unique display in the same section of the corrosion of condenser tubes. The exhibit includes colored diagrams showing sections of tubes and the scales which are formed on them in sea water. The diagrams prove that the rate of corrosion of the tubes is mainly depending upon the properties of the scale. A set of diagrams gives the reactions as a result of which the scales are formed. The manner in which the scales may break down and thus give rise to pitting are also illustrated.

Building Cars at Sharon, Pa.

YOUNGSTOWN, May 27.—The Standard Tank Car Co., Sharon, Pa., is building 250 standard box cars and 250 automobile cars for the Ann Arbor Railroad Co. These cars are now being distributed in the Mahoning and Shenango Valleys for haul to their destination.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
May	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
21.....	13.00	12.62½	41.25	7.10	6.85	6.05	5.70
22.....	13.00	12.50	40.50	7.00	6.75	6.00	5.65
23.....	12.87½	12.25	40.50	7.00	6.65	6.00	5.65
24.....	12.87½	12.37½	....	7.00	6.65	6.00	5.65
26.....	12.87½	12.37½	41.00	7.00	6.65	6.02½	5.67½
27.....	13.00	12.50	41.50	7.00	6.65	6.07½	5.72½

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, May 27.

The tone of the markets is a little better. Quotations for copper are a little firmer, but demand has not improved. The tin market is practically stationary both as to demand and prices. Lead prices have again declined with the bottom apparently close at hand. Further weakness has developed in zinc and demand continues light.

Copper.—The passage of the bonus bill unsettled the market last week and lower prices were again reported, electrolytic copper selling as low as 12.50c., delivered, late in the week. Since then a better tone has developed, due partly to higher prices in London and to the refusal of producers to meet low bids of exporters, until today the minimum price is generally recognized as 12.75c., delivered. Not much can be said, however, as to an increase in demand. There are a few inquiries for moderate quantities, but the market is by no means active. While some believe that the lowest prices have been seen on this movement and that copper will sell at 13c. before it again touches 12.50c., the actual course of the market is difficult to predict. Lake copper is quoted at 12.87½c. to 13.12½c., delivered.

Tin.—Only fair sales of Straits tin have been recorded with the total of the week aggregating 800 to 900 tons. On Thursday, May 22, about 300 tons changed hands, dealers being the principal buyers. Late the next day about 300 tons more was sold, made up largely of covering by shorts, with spot selling at 40.25c. and futures from 39.37½c. to 39.75c. As high as 40c. was bid later in the day for futures. A few parcels were sold on Saturday, but yesterday the market was stagnant and today has been very quiet, with spot Straits tin quoted at 41.50c., New York. London quotations today were about £6 to £7 per ton higher than a week ago, with spot standard quoted at £208 10s., future standard at £207 and spot Straits at £212 10s. Arrivals thus far this month have been 4630 tons, with 4602 tons reported afloat.

Lead.—Again the American Smelting & Refining Co. reduced its price, Thursday, May 22, by 25 points, or from 7.25c. to 7c., New York, in the face of a market that was apparently improving. The outside market was lower at the time which was evidently the reason for the reduction. For some days now the two markets have remained on the same level at 7c., New York, but the St. Louis market has eased off to 6.65c. so that for the first time in many weeks the freight differential of 35 points is in effect. The opinion is prevalent that the decline has run its course and that, although the market can go a little lower in view of the rate of consumption and production, as soon as consumers enter the market a sharp rebound is likely. They are expected to do this as soon as stable prices prevail.

Zinc.—Further weakness has developed until prime Western has sold as low as 5.65c., St. Louis, or 6c., New York. There has been no demand to sustain the market, particularly from the galvanizing industry. A little more interest now is shown at prevailing low prices, which are manifestly too low, and more inquiry is in evidence with prices showing an upward tendency. The present market is quotable at 5.70c. to 5.75c., St. Louis, or 6.05c. to 6.10c., New York.

Nickel.—Shot and ingot nickel are quoted at 27c. to 32c. per lb., with electrolytic nickel held at 30c. to 32c. by the leading producers. Shot and ingot nickel in the outside market are quoted at 28c. to 32c. per lb.

Antimony.—Wholesale lots of Chinese metal are quoted and have sold at 8.50c., duty paid, New York, for spot and early delivery.

Aluminum.—Virgin metal, 99 to 98 per cent pure, is quoted by importers at 27c. to 28c. per lb., duty paid, delivered.

Old Metals.—Business is quiet and values show little change. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.25
Copper, heavy and wire	11.25
Copper, light and bottoms	10.25
Heavy machine composition	10.00
Brass, heavy	7.75
Brass, light	6.50
No. 1 red brass or composition turnings	8.50
No. 1 yellow rod brass turnings	7.25
Lead, heavy	6.25
Lead, tea	5.25
Zinc	4.25
Cast aluminum	16.00
Sheet aluminum	16.50

Chicago

May 27.—Practically all of the metals, both virgin and used, have declined in a weak and quiet market. There has been, however, some future buying of copper on the theory that present prices are close to bottom. On the other hand, the prevailing idea is that lead will go still lower. Zinc demand is light, because of the curtailed operations of galvanizers. We quote in carload lots: Lake copper, 13.25c.; tin, 42.50c.; lead, 6.75c.; spelter, 5.70c.; antimony, 10.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 8.50c.; red brass, 7.50c.; yellow brass, 6c.; lead pipe, 5.50c.; zinc, 3.50c.; pewter, No. 1, 20c.; tin foil, 26c.; block tin, 30c.; all buying prices for less than carload lots.

Detroit Scrap Market

DETROIT, May 27.—The scrap market has not shown any signs of activity during the past week and dealers are predominating in the bidding on approximately 6000 tons of miscellaneous material offered by one of the largest producers. Old material is being stored by several of the larger dealers, who have practically withdrawn from the market.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	$12.50 to $13.50
Shoveling steel	12.50 to 13.50
Borings	9.50 to 10.50
Short turnings	9.50 to 10.50
Long turnings	8.50 to 9.00
No. 1 machinery cast	15.00 to 16.00
Automobile cast	21.00 to 23.00
Hydraulic compressed	10.00 to 10.50
Stove plate	13.50 to 14.50
No. 1 busheling	9.50 to 10.50
Sheet clippings	8.00 to 8.75
Flashings	9.00 to 9.75

As part of an experiment in non-resident graduate engineering research introduced a short time ago by Prof. R. S. McCaffrey, chairman department of mining and metallurgy, college of engineering, University of Wisconsin, a number of valuable projects are being carried on in Milwaukee and vicinity by plant executives who are graduates of leading engineering schools elsewhere. The research is to be offered as graduate theses and is conducted in the works with which they are associated. Commercial annealing of malleable iron is under investigation.

The American Consulate, Free City of Danzig, Poland, Edwin C. Kemp, consul, has information regarding proposed municipal port improvements, for which a foreign loan of $1,000,000 is to be secured, to include the purchase and installation of about 12 electric traveling cranes.

PERSONAL

Franz Messinger, engineer-in-chief of the Greater Berlin Gas Works, Berlin, Germany, is now in the United States by order of the directorate of the works for the purpose of making a study in public interest of American practice in the distribution of gas and its various uses. He is said to be the first engineer in Germany who has been able to produce a faultless weld with an illuminating gas flame, and is author of numerous technical articles. Mr. Messinger will visit about a dozen of the largest cities in this country.

John F. Gaffney, for several years in charge of foundries for the Bethlehem Steel Co. at Sparrows Point, Md., and for the Allis-Chalmers Mfg. Co., Milwaukee, has been employed as superintendent of the foundry for the Hadfield-Penfield Steel Co., Willoughby, Ohio.

H. N. Schreuder has been appointed Eastern sales representative, with headquarters at 50 Church Street, New York, for the National Engineering Co., Chicago, manufacturer of Simpson sand mixers and other foundry equipment. R. J. Richards, who formerly operated in Mr. Schreuder's territory, has been transferred to the Pittsburgh district.

C. D. Price, for many years connected with the Industrial Works at Bay City, Mich., recently as traveling service engineer, has been appointed sales manager of the St. Louis district with headquarters in the Railway Exchange Building, St. Louis.

L. D. Albin, formerly general sales manager of the Ingersoll-Rand Co., 11 Broadway, New York, has been elected vice-president in charge of European sales. D. C. Keefe, formerly assistant general sales manager, has been appointed to succeed Mr. Albin as general sales manager.

J. Marvin Doyle, vice-president, and one of the original partners of Ellenwood & Doyle, Inc., 29 Great Jones Street, New York, has resigned, effective July 1. Prior to the establishment of the partnership, he was connected for ten years with Bruce & Cook, dealers in tinsmiths' supplies, New York.

George R. Hine, who has been general superintendent of the Whitman & Barnes Mfg. Co., Akron, Ohio, for the past fifteen years, and associated with the company for over 23 years, has taken over the factory management of the New Process Twist Drill Co., Taunton, Mass.

J. M. Gates has been appointed resident manager at Philadelphia of the Eastern Fuel Co., Pittsburgh, in charge of sales in the Philadelphia and nearby districts of New Jersey, Delaware and Eastern Pennsylvania. Mr. Gates is a graduate of the University of Pennsylvania and for the past eighteen years, has been identified with the Philadelphia coal trade, first with J. Tatnall Lea & Co., and since 1920 with the Prudential Coal Co.

Edward C. Clark has joined the sales force of the New York office of the Eastern Fuel Co., Pittsburgh. He is a graduate of Yale University, class of 1921, and until recently has been identified with Savan Mine of the Savan Colliery Co.

Donald E. Montgomery has been appointed by Edward Nordman, State Marketing Commissioner of Wisconsin, as special investigator on behalf of the State in the matter of the abolition of he Pittsburgh basing practice. Mr. Montgomery for several years has been doing statistical work under Dr. John R. Commons, dean of the college of economics, University of Wisconsin, Madison.

A. H. Obendorfer, advertising manager Sivyer Steel Casting Co., Milwaukee, was re-elected president of the Milwauke Industrial Advertisers' Association at the third annual meeting held May 22. O. C. Dahlman, Koehring Co., was elected vice-president and William H. Brandt, Chain Belt Co., secretary-treasurer.

E. M. York, traveling sales engineer for the Cleveland Rock Drill Co., Cleveland, has been transferred to El Paso, Tex., from which point he will travel through the Southwest and Mexico. The Francis Wagner Co., El Paso, has been appointed general district representative in the Southwest for the Rock Drill company.

J. C. Wicks, who operates a selling agency at 1144 Hanna Building, Cleveland, under the name of J. C. Wicks & Co., has been appointed Cleveland district sales manager of the Thomas Sheet Steel Co., Niles, Ohio. He is also Cleveland sales agent for the Central Iron & Steel Co., Harrisburg, Pa., manufacturer of plates. Mr. Wicks formerly was president and general manager of the Garry Iron & Steel Co. and later was Cleveland sales manager of the Brier Hill Steel Co.

H. B. Wright, for eight years manager of the engineering department of the General Fireproofing Co., Youngstown, Ohio, has been appointed manager of the Youngstown district, in the territory now covered by the Builders' Steel Products Co., which will discontinue business June 1. Mr. Wright will have charge of the company's fireproofing, waterproofing and reinforcing lines, with headquarters at the home office.

A. E. Adams, Youngstown, Ohio, president of the First National Bank, director of the Youngstown Sheet & Tube Co., and numerous other industrial concerns, upon his return last week from a 10 weeks' trip abroad, declared he was greatly impressed by the economic waste in Europe, due to military establishments and customs regulations. While business there is improving, he states the process is so slow as to be scarcely perceptible. He believes the effect of the Dawes reparations program has been greatly overestimated in this country, stating many of the people in Europe are not convinced that it is a workable arrangement.

Steel and Coal Companies Object to Proposed Rating of Mines

WASHINGTON, May 26.—Rating of coal mines by use of the so-called commercial factor was strongly opposed by steel, coal and coke interests in the course of hearings last week before the Interstate Commerce Commission. The commercial factor relates to ability to market coal under all conditions, and steel and other owners of coal mines would be compelled to turn to the commercial market and sell coal in order to retain required supplies of cars when needed in their operations. Not being engaged in marketing their coal, but desiring to use it for their own purposes, they are opposed to the proposed change in rules on coal mine ratings. Moreover, they desire to conserve their special purpose coal, which they would be required to dispose of in the open market when they might need it most.

John M. Gross, general traffic manager of the Bethlehem Steel Corporation, told the commission that application of the rule would make it necessary to immediately build up a commercial rating of coal mines of the corporation and the dumping of approximately 6,000,000 tons of coal on a market which is now oversupplied. This would be required, he pointed out to have the mines sufficiently rated to protect needs of the steel plants in the event of a shortage of cars. When the steel industry became fully engaged, it was stated, the coal produced in the period of slack demand for steel and coal would be withdrawn from the market. The policy of the Bethlehem Steel Corporation, he said, is to conserve its coal.

Discrimination in favor of non-union mines, a tendency to reduce the price of coal and of wages would result from institution of the commercial factor, according to T. W. Guthrie of the Hillman Coal & Coke Co.

Boring and drilling machines manufactured at the Colburn works, Cleveland, of the Consolidated Machine Tool Corporation of America, will be manufactured at the Betts works of the corporation at Rochester, N. Y. The change was effected on account of large potential economies thus made possible.

OBITUARY

Ernest B. Johnson

Ernest B. Johnson, the oldest employee of the Jones & Laughlin Steel Corporation in its New York sales office in point of service, died on Friday, May 23, of peritonitis, which set in following an operation for appendicitis. He was 46 years of age. Mr. Johnson was assistant to Robert M. Kilgore, district sales manager. He entered the employ of the Jones & Laughlin Steel Corporation in its New York office 26 years ago as assistant to H. F. Holloway, formerly New York district sales manager, and continued in the same capacity when Mr. Kilgore succeeded Mr. Holloway. He was probably one of the best known steel salesmen in the New York territory. Mr. Johnson was taken ill very suddenly in his office on May 14 and was taken to a hospital and immediately operated upon, but the operation came too late to save his life. For a few days he rallied and there was hope for his recovery. His home was at 974 St. Nicholas Avenue, New York. The funeral was held from the Second Presbyterian Church, that city, on Monday evening. He leaves his wife and a married daughter.

E. B. JOHNSON

J. E. MEEK, vice-president Johns-Manville, Inc., died on May 24 of heart disease, aged 60 years. He was born near Altoona, Pa., and was a member of a family which figured prominently in the Revolutionary War. Mr. Meek was a member of the Engineers', Lotos Club and of several other clubs and societies. He is survived by his wife.

E. C. HAWKINS, aged 32 years, construction engineer and treasurer of the Hawkins-Downie Co., Youngstown, Ohio, died May 23, following an illness of two weeks with pneumonia.

FRANCIS BACON JAMES, prominent attorney of Washington and an active figure in traffic circles of the iron and steel trade, died suddenly in his office on May 21, aged 60 years. He frequently had appeared before the Interstate Commerce Commission for iron and steel producers.

W. T. BURT, aged 45 years, vice-president of the Wheeling Steel Co., Wheeling, W. Va., was killed on May 22, in an automobile accident at Washington, Pa.

HORACE L. RUTTER, president Robert Rutter & Son, Inc., 410 East Thirty-second Street, New York, died May 14.

President Campbell Sees Hopeful Signs

YOUNGSTOWN, May 27.—President James A. Campbell of the Youngstown Sheet & Tube Co. sees hopeful signs for future of the steel industry. "Last week, for instance, we booked more orders for sheets than in the previous three week period," he states. "In other finished lines, however, new business is slack and shipments still exceed incoming orders. Net earnings of the company in April aggregated $1,161,276, from its major properties, but not including a number of minor subsidiaries.

"We not only earned the proportionate share of our dividends in April, but together with the surplus from the first quarter, we earned enough the first four months of the year to cover three dividends on the common stock, and still have something left over," he stated. The company earned $3.05 per share on its common stock the first quarter, and about $1 per share in April, making $4 per share on common for the first four months of the year.

JAPAN BUYS TIN PLATE

Order Said to Be Divided Between Large Independents—Keen Competition on Sheets and Low Prices

NEW YORK, May 27.—Merchant buying from Japan is still light. Few of the recent inquiries for black sheets seem to have developed into business, despite relatively low prices submitted by American exporters. It is said that as low as $93.50 per ton, c.i.f. Japan has been quoted on black sheets, 13 to the bundle, without result. Japanese buyers, it is claimed, are offering to consider business at $92 per ton, c.i.f., but in the face of this price is the reported quotation of some British sellers of £20 17s., at present exchange about $90.50 per ton, c.i.f. Japan. Nevertheless, British exporters complain of keen American competition in the Japanese market.

The recent inquiry of the Nippon Oil Co. for 56,000 base boxes of oil can tin plate was awarded to Mitsui & Co., New York, and Iwai & Co., New York, an equal division being made. Both exporters are understood to have placed the business with large independent mills. Mitsui & Co. are also understood to have booked the small tonnage of rails recently asked for by the Keh-Hin Electric Railway Co. The tin plate is reported to have gone at a c.i.f. Japan price, which, deducting freights and extras, figured back to about $4.80 per base box, Pittsburgh. The Imperial Government Railways are in the market for 170 tons of plain and 220 tons of galvanized telegraph wire. A recent tender went to the Inui Telegraph Wire Co., Osaka.

Although British sellers complain of American competition in Japan as a result of the weakness in the American market, the same situation apparently is not as well developed in the Chinese markets, where British business is said to be still fairly good. At present, Chinese merchants show only a mild interest in purchasing American material, believing that prices are destined to go still lower. A recent offer of a small tonnage of second-hand plates to China at $40 per ton, c.i.f., brought out a counter offer of $31 per ton. Chinese buyers complain of an apparent shortage of the types of second-hand material which they usually buy, not only in the United States, but in the British and Continental markets.

Exporters to the Far East point out that recent price declines will be somewhat offset after July 1, by the steamship conference's increase in freight rates. The rate to Japanese ports, effective July 1, will rise from $8 to $10 per ton and from $8 the present rate to Chinese ports to $10 with $10.50 applying on shipments to Shanghai.

Secondary Plants Busy

YOUNGSTOWN, May 27.—Secondary steel plants in this district continue to maintain uniformly satisfactory operations. Chief among them is the Truscon Steel Co., which is operating all departments in full. The General Fireproofing Co. is at 90 per cent. The Youngstown Pressed Steel Co. at Warren is close to a normal operating basis.

These interests, catering largely to building construction requirements, report sustained business from a variety of sources.

The Newton Steel Co., a primary interest, is feeling the effects of larger business volume from the automobile industry.

The alleged plot at Chicago to defraud the New York Central Railroad, in connection with purchases during the closing days of the Railroad Administration in 1920-21 was long before the organization of the firm of Erman & Co. The latter were mentioned in THE IRON AGE of May 15 in a news item on the indictment of several scrap men, including a former employee of this firm. Erman & Co. were in no way connected with the New York Central transactions.

Judge Gary Replies

(*Concluded from page* 1560)

conferences generally; but after careful and painstaking consideration, the differences were always adjusted.

"The first meeting of the general committee with the War Industries Board took place when Judge Lovett was chairman. After a day's session without arriving at an agreement, the War Industries Board adjourned, but, as Mr. Baruch states, I asked the board to remain in an adjoining room for a short time, and later in private conferences, at which I remember Judge Lovett was present and also Mr. Legge, who was very efficient and helpful, we agreed upon the price of $3.25 (I think) for plate, and also upon other prices, all of which were later approved by the President.

Prices Fixed After Disagreements

"As I remember, our committee met the board when Mr. Scott was chairman. We then agreed upon prices after considerable discussion and some disagreements at first.

"About three months later, probably, we met the board when Mr. Willard was chairman, and then agreed upon prices for the next three months. At that meeting, Mr. Willard suggested that there had been considered the propriety of the Government taking over the steel industry, and he made the promise that the steel men would be given previous notice of any further consideration of the subject.

"Still later the chairman of the General Steel Committee received notice to appear in Washington to discuss the subject of taking over the steel industry by the Government, as I described in my address, and with the result mentioned. I cannot now fix the exact dates of these meetings, but perhaps I can get them from the secretary of the committee, who is away at present, though I do not consider them at all important.

"The steel industry had been cooperating, satisfactorily to both sides apparently, with the War Industries Board for many months before the question of taking over the industry was brought up for consideration and determination, as I have described. If there had been previous discussions in Washington with reference to this subject, the steel men were not present nor informed.

"If anything was said in my address concerning this matter or any other which offended any one, I very much regret it. As to whether or not the Secretary of the Treasury suggested it, it was expressly disclaimed that there was any knowledge on the subject, and positively asserted there was only a report in circulation to that effect. If he cares anything about it, he will probably deny that he made the suggestion. If so, he will find no one in the steel industry to dispute him. I feel very certain if he made the suggestion, based on any information received, he would not be ashamed of it. It would, of course, have been a great calamity if the steel industry had been actually taken over by the Government."

Mr. Baruch's Retort

In reply to Judge Gary's statement Mr. Baruch said Monday night that he was glad the steel chairman had "confirmed my recital of the facts up to Sept. 21, 1917."

"I repeat that after this chapter had ended and the steel industry had fallen into line with the Government on prices and service, there was no further consideration by the War Industries Board of commandeering the steel industry, the necessity for such a wartime expedient having passed, and the industry having proved —Judge Gary says—'loyal, energetic and efficient.'"

Charles Pettigrew, formerly superintendent of the Joliet, Ill., works of the Illinois Steel Co., and general manager of the Sparrows Point, Md., plant of the Maryland Steel Co. (now a part of Bethlehem Steel Co.), left $100,000 to the Silver Cross hospital at Joliet, according to his will recently probated at Bridgeport, Conn. Mr. Pettigrew died at Pasadena, Cal., May 22, 1923.

EXPANSION AT LOS ANGELES

Extensive Improvement Program—Building in Other California Cities

SAN FRANCISCO, May 22.—Additional public improvements of extensive proportions are planned for Los Angeles. At the primary election on May 6, six proposed bond issues were submitted to the voters. Five of these were carried, involving the expenditure of sums totaling $46,900,000 for various civic betterments in the city and county. Two of these bond issues provide for the construction of two gigantic dams for water conservation and flood control purposes, others for additional police facilities and equipment, more adequate fire protection at the harbor, bridge improvements and a new municipal incinerator.

The advance of the industrial area in Los Angeles absorbed another good-sized section of the famous old Don Juan Bandini estate, which at the time of its original grant to the old Spanish Don by the Mexican Government in 1838, comprised a total of a little more than 200,000 acres. Announcement has just been made of the purchase of a 500-acre tract in one corner of the estate near the site of the growing "central manufacturing district," for a stated consideration of $5,560,000 paid by a syndicate of capitalists headed by W. H. Daum, a well-known Pacific Coast financier. This tract is to be sub-divided and devoted to industrial plants. Options have already been taken on two five-acre, one 10-acre and one 12-acre sites.

The sum of $3,000,000 will be expended by the Jonathan Club of Los Angeles in the erection of its new home, which is to occupy a downtown site at the corner of Sixth and Figueroa Streets, just leased by the club for 99 years. The plans for the new edifice, now completed, cover the entire lot 195 x 180 ft., the building being 12 stories.

In the East Bay section the Great Western Power Co. has completed plans for two noteworthy improvements. At El Cerrito near Oakland, $700,000 will be expended for extensive additions to its Golden Gate sub-station, in order to provide additional power and lighting facilities in that rapidly growing area. At Antioch, in Contra Costa County, a few miles to the north, the company will expend $250,000 to increase the capacity of the sub-station at that place.

At Monrovia, Los Angeles County, a $2,560,000 investment is planned by the Colby Manufacturing Corporation for construction of a foundry, machine shops and two assembling plants. Other improvements in the same city include a $150,000 two-story community hotel and a $165,000 theater building, both to be erected on West White Oak Avenue during the coming summer.

The new Clift Hotel to be erected on Geary Street in San Francisco will cost $1,600,000. It will be 15 stories in height, a class A steel frame concrete structure embracing every modern feature. Other noteworthy improvements include a $300,000 stadium in Golden Gate Park nearly opposite the Polytechnic High School; a two-story steel frame factory for the Kleiber Motor Truck Co., to cost $165,000, and four class A apartment houses to cost $380,000.

Youngstown Scrap Market

YOUNGSTOWN, May 27.—The iron and steel scrap market is listless in this district, in face of greatly reduced steel-making operations and declining blast furnace production. With broader finishing mill schedules, district interests continue to produce enough scrap in rolling mill units to supply their requirements in large measure.

The market on heavy melting ranges from $15.50 to $16, with other grades proportionate.

Dealers are finding considerable difficulty in moving scrap stocks, and are therefore cautious in making commitments. There appears to be little likelihood that steel-making will appreciably improve over the next few months, and old metal interests look for a dull summer, with business picking up in the fall.

What current tonnage is moving is for small lots.

Sixth Sectional Meeting of Steel Treaters

(*Continued from page* 1567)

Possibly high power magnification will disclose what happens in the quenching.

Macroetching of Forging Steel

Mr. Nelson himself delivered a paper on drop forgings, in which he devoted particular attention to the use of the macroetch to disclose defects in forging steel. He showed stereopticon views of typical ingots: (1) the effervescing type, (2) the ingot with deep piping, (3) an ingot intermediate between those two types and (4) the hot top ingot. He then showed hot acid etchings of bars made from all four kinds. From the first type is obtained a bar full of small cavities, not apparent upon shearing unless etched. The bars from types 2 and 3 also show defects. A pipe crack, he said, for example, is bound to show up in a forging after heat treating. Bars made from ingots of Type 4 are the most desirable, but even in this case there is no insurance of freedom from defects. Frequently these ingots have burst centers and it is notable that, even if a defect is deep seated, it will flow out at points 180 deg. apart on the flash line of the forging.

Macroetching, the speaker said, indicated the necessity of using only first class material. In his company one bar of every heat received is etched as well as tested for chemical and physical properties. Inasmuch as the chemistry of the steel will not indicate what heat treatment should be prescribed, it is necessary to heat treat a sample from each heat. This does not necessarily lead to rejection of material but rather determines what it will be used for. A small section might respond to heat treatment when a larger section of the same chemical analysis would not. The work is so organized that if steel from a given heat is received in the morning, tests are made and completed so that the material is ready to use the next day.

Mr. Nelson also described the care which must be exercised in drop forging manufacture to make the grain flow follow the center line of the product, no matter how irregular in shape it may be. This is particularly true in the case of gears. Noise is due to distorted gears and distortion results from the release of strains in machining operations. The problem is to distribute the strain throughout the material to prevent warping in heat treating. Uniformity of the flow of the grain is the prime requisite.

Shorter Annealing of Malleable Iron

The possibilities of producing malleable iron and intermediate products of value in short annealing periods was discussed in a paper prepared by Dr. Anson Hayes and W. J. Diederichs, Iowa State College, Ames, Iowa, and read by Dr. Hayes.

Experiments which the authors conduct indicated that malleable iron of satisfactory specifications can be made within a 31-hr. annealing period and it is asserted that one-day malleable iron is well within the possibility of laboratory demonstration. Using shorter annealing periods, other products having desirable properties were produced. At 10½-hr. over-all annealing time, a material was made which met the specifications of the American Malleable Castings Association. All of the products intermediate between white iron and malleable iron, which were treated, had properties which should find commercial uses as a substitute for malleable iron and steel for certain purposes. The yield point is as high as that for normal steels of the same combined carbon content and is superior to that of malleable iron. The shock resistance is comparable with that of steel and though less than that of malleable iron would seem to be ample for many purposes. The ductility also would seem to be sufficient to allow slight changes in shape sometimes required in assembling and similar operations.

Analysis of Oxyacetylene Flame

"Steel under the Oxyacetylene Flame" was the subject of a paper read by Alfred S. Kinsey, professor of shop practice, Stevens Institute of Technology, Hoboken, N. J., and advisory service engineer Air Reduction Co., New York. He said in part:

"There is no other gas in common use containing as high a percentage of carbon as acetylene, nor is there any supply of gaseous carbon equal to that found in acetylene. And, with the exception of the electric arc furnace, there is no other heat so intense, so concentrated and so convenient of manipulation as acetylene burned in an atmosphere of pure oxygen through an oxyacetylene welding torch."

"Acetylene has a peculiar property which generally enhances its value as a combustible gas. Gases generally are divided into two classes, one having the characteristic for generating heat and called exothermic and the other absorbing heat and known as being endothermic. There are only a few endothermic gases, one of which is acetylene. Its property for absorbing heat is higher than any other gas except one, being equal to 227 B.t.u. per cu. ft. of gas."

"When acetylene starts to burn, as in the oxyacetylene welding torch, its first temperature of combustion is about 4000 deg. Fahr., the stored up heat of the gas is then released, which causes the temperature to rise to about 6300 deg. Fahr. This is due to the endothermic property of the gas, which is probably its chief asset and has had much to do with making it the most efficient of all gases for welding and cutting of metals. It not only contains an unusually large amount of heat, to the extent of 1685 B.t.u. per cu. ft., but also has the characteristic of releasing these heat units at so rapid a rate that the highest temperature of the flame is supplied instantaneously. . . ."

"Before the advent of the oxyacetylene torch practically all welding was accomplished by the old forge practice of heating the metal to the soft plastic condition and hammering the two ends together, and as the success of this weld depended on the metal being brought to the plastic state, only metals having such a plastic state could be welded. This limited welding to wrought iron and low carbon steel. When the oxyacetylene flame became available a new way to make welds was discovered, which depended on the principle of fusion rather than that of plasticity. . . . The limits of welding were therefore extended from wrought iron and steel to all the other metals of the ferrous group and to those of the non-ferrous group. . . ."

"When it is required to raise the temperature of an important piece of steel to a red hot or molten condition two things must be considered: 1. The effect on the chemical nature of the metal, and, 2. The change in the physical properties. . . . When the oxyacetylene flame is pressed down upon the metal the outer part of the flame, called the envelope, covers the molten metal and thereby insulates it from the air, and because of the character of the flame, a neutral atmosphere is created which prevents removal of the chemical elements of the steel. This is due not alone to the complete combustion within the envelope of the flame produced by a sufficient supply of oxygen, but chiefly to the principle of the border consumption of the flame. That is, as the carbon from the acetylene is sent into combustion by the extra supply of pure oxygen through the torch, the products of combustion, thrown off at the point of the inner flame cone, consist of hydrogen and carbon monoxide. These gases cannot burn inside of the flame because of the high temperature of the cone. They therefore move outward to the border of the flame where they reach the atmosphere and are cooled. Then they combine with the oxygen of the air and burn, the hydrogen forming water vapor and the carbon monoxide changing to carbon dioxide. The carbon monoxide has a strong affinity for oxygen, and it therefore combines with the air on the edge of the flame envelope. It might otherwise pass through it and change the composition of the metal. It will be of interest to add that when the first combustion of oxygen and acetylene occurs, yielding hydrogen and carbon monoxide at the tip of the cone, a temperature of about 6300 deg. Fahr. is produced. Then when the hydrogen burns and forms water vapor the temperature is about 3800 deg. Fahr., and when the carbon monoxide changes to carbon dioxide the temperature is further reduced to about 2300 deg. Fahr. In this remarkable flame therefore may be found a range of temperature from 6300 deg. Fahr. at the cone tip to 2300 deg. at the end of the envelope. . . ."

"Almost any source of high temperature will melt steel, but it may have been accomplished at the expense of the refined condition of the grains and the possibil-

ity of restoring the heated metal to its original granular structure and strength. The ideal flame for heating of steel is that which will create about the hot metal such an atmosphere that the reassembling of the grains may be accomplished without interference from oxides or changes in the chemical elements."

Heat Treatment of Steel Dies

"Heat Treatment of Steel Dies" was described by C. B. Swander, metallurgist Wagner Electric Corporation, St. Louis. His remarks were, in part, as follows:

"With the increasing use of high-speed steel for dies, the steel treater has been compelled to improve the hardening practice. Only dies of the simplest forms can be ground on all sides after hardening. Fully 95 per cent are made to finished dimensions before hardening. This means that the hardener must treat such work without scaling, blistering or distorting to any marked degree. The average steel treater finds this very difficult to do if he gives the recommended practice treatment. The process to meet these requirements found both practical and economical and within the scope of the average size hardening room is:

"Inspect the crucibles and lids to see that the lids fit tightly. Put about three quarters of an inch of a mixture of one half charcoal and one half silica sand in the bottom of each crucible. On this place a dish of graphite made from a crucible lid. Pre-heat two of the graphite crucibles and lids in the pre-heating furnace to 1500 to 1600 deg. Fahr. and one of the crucibles with a tight fitting lid in the high heat furnace to 2500 deg. Fahr. One of the pre-heated crucibles is now removed from the furnace. The work to be hardened is inserted. The crucible and contents are returned to the pre-heating furnace. As soon as the work is pre-heated to 1500 to 1600 deg. this crucible is removed and the one in the high heat furnace removed and the work quickly transferred to the high heat crucible. The lid is carefully put in position and the crucible and work which it has just received placed in the high heat furnace held at 2200 to 2300 deg. Fahr., depending on the composition of the steel, for a pre-determined length of time, which naturally varies with the dimension and weight of the work, varying from 5 to 15 min. Ten minutes is very satisfactory for all but very light pieces and pieces 1-in. through or over."

"The crucible and contents are now removed from the high heat furnace, the lid is removed and the work quickly quenched in a good grade of quenching oil. When cooled to about 150 to 200 deg. Fahr. it is transferred to a hot tempering oil bath maintained at 400 deg. Fahr. for 10 to 15 min.; then finish drawn in a salt bath for about 20 min. at 1100 deg. Fahr. Then it is cooled in oil. The salt film is now dissolved off in hot water and the die allowed to cool in air. By using two crucibles for pre-heating, the cycle becomes continuous. Always have pre-heated work ready for the high heat crucible when it is empty. If the work is very light, one pre-heating crucible is often sufficient. The dies come out remarkably clean, free from all blistering and scaling, all sharp cutting edges in perfect condition and with very little dimensional changes. . . ."

"The main difference between the method outlined and standard practice is the use of graphite crucibles in which the work is heated. The method is very economical to operate and produces work free from scale, blisters and pits with full secondary hardness properties. Pieces made from round high-speed steel stock always expand on the linear dimension and shrink on the cross sectional dimension when treated by this method. Pieces from rectangular stock show less movement on dimensional changes than those from round stock."

Another feature of the program was a description of the manufacture and the various uses of abrasives, illustrated by stereopticon slides, by H. W. Dunbar, the Norton Co., Worcester, Mass. Mr. Dunbar also illustrated the use of various kinds of abrasive wheels on different materials, having set up a motor-driven grinding stand in the hall for the purpose.

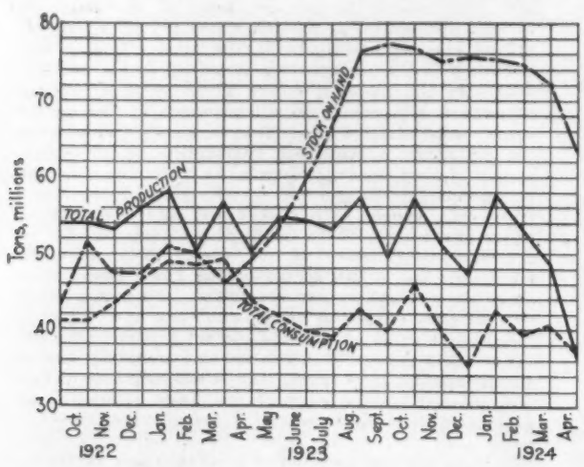
BUSINESS TREND DOWNWARD

Coal Production Hits Low Point—Report of National Association of Purchasing Agents

Based on the National Association of Purchasing Agents survey of coal consumed for industrial purposes, the volume of business, as a whole, during April decreased 10 per cent, as compared with the preceding month. Basing the figures on daily averages, April shows a decrease of 7½ per cent, as compared with March. The trend of the total volume of business in 1924 as compared to the same month of 1923 was:

January, 1924 shows a decrease of 13 per cent compared with January, 1923.
February, 1924 shows a decrease of 21½ per cent compared with February, 1923.
March, 1924 shows a decrease of 17 per cent compared with March, 1923.
April 1924 shows a decrease of 16 per cent compared with April, 1923.

Of the total number of reports received from consumers of industrial coal for April, 14 per cent indicated increases in business, 19 per cent remained stationary, and 67 per cent showed decreases, as compared to the preceding month. The downward trend in business has been general with the exception of some of the seasonal lines. Indications are that the bottom has not been reached, and that the month of May will show a further slight downward curve.



The lines on the chart showing the consumption and stocks of coal are drawn from data supplied from all parts of the United States and Canada by commercial consumers of coal and represent all lines and branches of business and industry. The line showing the production of coal is drawn from figures given out by the U. S. Geological Survey. The chart includes both bituminous and anthracite coal and covers the total stocks in the hands of commercial consumers, the total tonnage consumed, and the total production by months.

Estimated Stocks on Hand	Net Tons
February 1, 1924	75,507,000
March 1, 1924	74,708,000
April 1, 1924	72,192,000
May 1, 1924	63,403,000

	Total Production Net Tons	Estimated Industrial Consumption
Month of January	57,992,000	42,650,000
Month of February	53,355,000	39,441,000
Month of March	48,713,000	40,782,000
Month of April	36,364,000	36,686,000

(Of the April production 29,582,000 tons was soft coal, and 6,782,000 tons were hard coal.)

Reserve stocks are being reduced rapidly. During April approximately 7,500,000 tons of coal was consumed in excess of the tonnage produced.

The status of trade apprenticeship and organization for successful apprenticeship are discussed in "Trade Apprenticeship," a report by the committee on apprentice systems of the American Management Association, 20 Vesey Street, New York. The report is designated as plant executives series No. 3, and covers 64 pages, 6 x 9 in. L. L. Park, superintendent of welfare, American Locomotive Co., is chairman of the committee.

Purchasing Agents Discuss Contracts

(*Continued from page* 1569)

was a time when purchases were based on fracture, but that was all guesswork.

Mr. Lowry emphasized the fact that uniformity in castings was due more to heating temperatures than to metal contents. To determine proper temperatures it is necessary to make tests not only on small, but volume production as well, and these should be continued at the furnace on each melt.

Use of Scrap

In the discussion following Mr. Lowry's address, he was asked if it were true that blast furnaces make it a practice to use tin cans and other light materials in melts, and that the use of such metals does not show in the analysis of the iron, but does show in castings from iron made with such material. He was reluctant to discuss this question at length, because, as he said, "I feel we are likely to step on somebody's toes." He added that materials used usually are borings, short turnings, bundled sheets and miscellaneous scrap. In a 10,000 lb. charge, he said, about 500 lb. of scrap could be added without increasing the fuel cost. In such instances the melting rate is faster, but the metal is not properly produced, and shrinkages in casting invariably result. Pig iron can be made from scrap if properly made, but Mr. Lowry is in favor of no reference being made to scrap in the pig iron contract.

G. W. Sanborn, United Engineering & Foundry Co., presided at the iron and steel dinner and meetings.

Manufacture of Wire

Dwight Granger, district superintendent Worcester district, Wickwire-Spencer Steel Corporation, Worcester, Mass., gave an instructive outline of the manufacture of wire and wire products from the purchasing agent's standpoint. His address began with an outline of the thousands of uses to which wire is put in this age. Ore mines, transportation of ores, blast furnace operations, refining furnace operations, ingot molding operations, soaking pit operations and rolling mill operations were briefly sketched.

Step by step the progress of the metal was followed by Mr. Granger, through to the finished product of the wire mill. The address was indicative of the multiplicity of operations necessary even to produce fence wire, and that it is only quantity production and increasing vigilance on the part of mill officials that make even the present price of wire possible.

"The purchasing agent's job," declared Mr. Granger, "is to buy the best quality of wire he can obtain to perform the operations which his production department demands. Sometimes he attempts to buy the cheapest wire possible, but experience always tempers considerations of cost with due regard for quality. The cheapest is not usually the best, and many times we have seen decided savings accomplished through the use of a slightly higher priced material. Every reputable wire man will tell you frankly what grade of wire is necessary for your particular purpose, and will not attempt to sell gold where brass would do as well."

He then outlined an easy reference for the main classes of wire on the market, and in brief detail gave the uses for each grade. In closing his address reasons were given for various prices on wire, their relation to accuracy, analysis, stiffness and finish.

Fuel Supplies and Costs

The questions of fuel supplies and costs as related to general industry attracted considerable interest. L. F. Leighton, president New England Wholesale Coal Dealers' Association, spoke on "The Fuel Situation," and T. W. Harris, Jr., E. I. duPont de Nemours & Co., Wilmington, on "Coal vs. Fuel Oil." Mr. Leighton's address first treated the expansion of the bituminous coal mining industry from 1904 to 1924. The tremendous increase, in his opinion, did not begin to tax the capacity of the mines, but it did tax the railroads.

"The overdevelopment of mine capacity during the war left us with a capacity for producing 750,000,000 to 800,000,000 tons per annum. This increased number of mines naturally attracted an excessive number of miners, so that today we have approximately 200,000 more soft coal miners than are needed. The only way that such an excessive number of miners can live is by the maintenance of high wages.

"While miners' strikes caused sharp advances in prices for fuel, prices reached their highest level as a direct result of shopmen's and switchmen's strikes on the railroads. The concerted efforts of coal operators to reduce wages in 1922 would undoubtedly have been successful except for the sympathetic strike of railroad employees in July, which cut down production from 5,000,000 tons to 2,000,000 per week.

"I believe the year 1924 is the beginning of a period of normal conditions in the coal industry, of low prices, and of improved quality through the employment of modern mining equipment and cleaning devices. High wage agreements running for three years have been signed by some operators, but in the non-union New River mines and a few in the West Virginia, Pocahontas and Pennsylvania mines wages are back to approximately the 1917 scale. It seems to me that the demand for coal this year will not be sufficient to force non-union mines to advance wages to the union basis. In 1921 over 65 per cent of the bituminous coal was produced at union mines. Since then there has been sufficient new mines opened in the non-union field and elsewhere, so that today non-union mines could produce 60 per cent of the fuel needed."

Mr. Leighton urged that purchasing agents so regulate their purchases of soft coal that production in the warm six months of the year might at least be held on a par with that during the cold six months.

As to oil vs. coal as a fuel, it was agreed that the peak in oil production has passed, and that oil is a much more expensive fuel than coal in many parts of the country, including New England and the Atlantic States in general. Mr. Leighton maintained that, with high-priced oil and a limited supply and with low-priced coal and an almost unlimited supply, consumption of oil in stationary boiler plants will steadily decrease. "During the last six months, Eastern plants burning a total of approximately 1,000,000 tons of coal annually have discontinued the use of oil."

Association Is Prosperous

The report of President Charles A. Steele, H. K. Mulford Co., Philadelphia, showed the association to be in a prosperous condition and expanding. In 1917, at the convention in Pittsburgh, it was voted that the Incorporated National Association of Purchasing Agents should cease to exist, and a new association unincorporated take its place. President Steele reports this has been found to be an undesirable change, and steps have been taken to relieve the individual responsibility of members and to incorporate.

Election of Officers

A. G. Hopcraft, the Ferro Machine & Foundry Co., Cleveland, was elected president of the association to succeed Mr. Steele. George C. Bestick, the Heald Machine Co., Worcester, Mass., was made treasurer, and will serve as district vice-president for New England as well. W. L. Chandler, New York, was reelected secretary.

The retiring and new presidents automatically become vice-presidents at large. G. B. Ivey, assistant purchasing agent of the city, New Orleans, and Blaine Gavett, Grand Rapids, Mich., were elected to serve in this capacity as well.

Non-Ferrous Conferences

Non-ferrous metals conferences were held at the convention under the direction of Walter V. Helmel, Motor Products Corporation. The statistical position of the various non-ferrous metals, as well as the prominent factors entering into the prognostication of the non-ferrous metal market, were discussed by various members attending, and there was a paper by W. H. Bassett, technical superintendent and metallurgist, American Brass Co., Waterbury, Conn., on "Recent

Advances in the Production of Copper and Copper Alloys."

Informashow

Of the approximately 160 exhibitors making up the informashow, operated in connection with the convention, about 27 per cent are directly associated with the steel industry or affiliated with the machine tool industry and users of metal working equipment. Following are some of the firms making up the 27 per cent:

Acme Steel Goods Co., Chicago.

Air Reduction Sales Co., New York, airco oxygen, exyacetylene welding, etc.

The Babcock & Wilcox Tube Co., Beaver Falls, Pa., seamless steel tubes.

The Baldwin Chain & Mfg. Co., Worcester, Mass., chains and sprockets for power transmission and conveying.

Baltimore Copper Smelting & Rolling Co., Baltimore.

John Bath & Co., Worcester, Mass., high speed steel, taps, micrometers.

The Bourne-Fuller Co., Cleveland, high speed steel.

Braman, Dow & Co., Boston, valves and engineering specialties.

Brown & Sharpe Mfg. Co., Providence, R. I., machinery, tools and cutters.

Buckner Process Co., Worcester, Mass., belting.

The Carborundum Co., Niagara Falls, abrasive and refractory materials.

Chicago Belting Co., Chicago.

Clark Equipment Co., Buchanan, Mich., drills and reamers.

Cleveland Twist Drill Co., Cleveland, drills and reamers.

The Cuyahoga Spring Co., Cleveland, springs and wire goods.

Detroit Twist Drill Co., Detroit, carbon and high speed twist drills, reamers, etc.

Federal-Mogul Corporation, Detroit, bearings.

Graton & Knight Mfg. Co., Worcester, Mass., belting.

The Lake Erie Bolt & Nut Co., Cleveland.

The Lunkenheimer Co., Cincinnati, engineering specialties.

P. F. McDonald & Co., Boston, steel.

Michigan Smelting and Refining Co., Detroit.

Morse Twist Drill & Machine Co., New Bedford, Mass., drills, reamers, cutters, etc.

Mueller Metals Co., Port Huron, Mich., brass and copper products.

Norton Co., Worcester, Mass., grinding wheels, grinding machinery, refractories and laboratory ware.

Olmsted-Flint Corporation, Cambridge, Mass., belting.

Oxweld Acetylene Co., New York, welding and cutting equipment and supplies.

Richards & Co., Boston, sheet metals, pig metals, etc.

Charles A. Schieren Co., New York, belting.

Scovill Mfg. Co., Waterbury, Conn., brass mill products.

The Seymour Mfg. Co., Seymouralloy sheets, wire, rods and tubing.

Simonds Saw & Steel Co., Fitchburg, Mass., metal cutting saws, etc.

The L. S. Starrett Co., Athol, Mass., mechanical tools.

The Vanadium-Alloy Steel Co., Latrobe, Pa., steel manufacturers.

The Vichek Tool Co., Cleveland, drop forged mechanics' tools.

The Wallace Barnes Co., Bristol, Conn., springs, machine tool products, wire and steel.

Walworth Mfg. Co., Boston, valves, fittings and tools.

Wheel Trueing Tool Co., Detroit, tools.

BLAME POLITICS

Quad Cities Believe Last Cycle of Readjustment at Hand

MOLINE, ILL., May 23.—The immediate business outlook is not regarded as favorable in the "Quad Cities," comprising Moline, Rock Island and East Moline on the Illinois side of the Mississippi River and Davenport on the Iowa bank. This community, with a combined population of upward of 150,000, is one of the most important farm implement manufacturing centers in the country. The implement industry has been consistently dull during the last three years and hence it is not surprising that a cautious view should be taken regarding business prospects. Operations of typical large implement plants, which reached 40 or 50 per cent earlier in the year, now range from 25 to 30 per cent. This reduction is attributable, in part, to seasonal factors, such as the natural tapering off of tillage tool production, but responsible business men here are candid in expressing the opinion that there are more deep-seated reasons for current reaction.

Slow business, it is felt, may continue throughout the remainder of the year. This view is not based on pessimistic timidity, but upon a conviction that the country is entering the last cycle of post-war readjustment. Little sympathy is shown, for the popular belief that politics alone is responsible for the retarded rate of industrial activity. More fundamental causes are pointed to. The farmer is not earning enough at the present prices of his products to buy the goods offered him. Artificial aid for the agriculturist, however, is condemned on the grounds that it will only delay the return of a normal balance between products of the soil on the one hand and products of the factory on the other. Business leaders here are active in their efforts to defeat the McNary-Haugen bill because it would result in a second inflation of wheat prices, and incidentally wheat lands, at the very time when final recovery from the effects of wartime inflation is in sight.

The need of the time is rather for the rest of the country to step down to the farmers' level than to attempt artificially to pull the agriculturist up temporarily to a higher plane. Much of the present difficulty lies in the fact that labor has taken practically no deflation except in the fields. The coal miner retains an exorbitant wage which is sufficient to sustain him even though the mines are operating on a sharply curtailed basis. This fact, of course, has kept up the price of fuel, which is basic in our economic life. High fuel, as well as high wages among transportation employees, have prevented a reduction in railroad operating costs which would permit lower freight rates. Lower rates, however, are vital to the farmer located at a distance from the central markets.

The freight frequently means the difference between profit and loss on his products. At the same time, high freight on manufactured products further reduces his buying power. Our agricultural population has suffered severely at the hands of labor in its selfish insistence on uneconomic wages. The attempted political affiliation of the farmer with labor in the so-called Farmer-Labor party is difficult to understand on any other basis than an utter lack of knowledge regarding current economic factors.

Stockholders of the Amerlean Rolling Mill Co., Middletown, Ohio, at a meeting May 15, authorized the increase in the common stock of the company from $20,000,000 to $30,000,000. The old board of directors was reelected. The increase in the capital stock of the company is for the purpose of paying a 4 per cent stock dividend yearly for the next ten years.

Life insurance protection of $1,000 and health and accident insurance providing for the payment of $10 weekly for 26 weeks in the event of illness or injury has been placed on each of the 150 employees of the Manufacturers' Foundry at Waterbury, Conn., under a group insurance plan on a contributory basis, with employees and employer sharing in the payment of the premiums.

Steel furniture shipments in April announced by the Department of Commerce on reports from 22 makers amounted to $1,658,610 compared with $1,661,303 in March and with $1,520,286 in April of last year. Except for March, the current figure is the highest in a year.

Manganese ore imports for February, as covered in a table on page 1473 of our May 15 issue, showed 2843 tons coming from Belgium. This report was an error on the part of the Department of Commerce, as the 2843 tons came from Brazil.

Urges Elimination of Pittsburgh Basing

(*Continued from page* 1573)

always necessary to distinguish 'uniform Pittsburgh plus prices' from 'uniform mill base prices.' The latter prices at each mill as the result of price competition are the ones we are striving to secure through the eradication of the Pittsburgh plus system."

Quotes Judge Gary

To support further the contention that the Pittsburgh plus system lessens competition among steel users, Mr. Steinhauer quotes Judge Gary as saying that under this system Chicago fabricators could not do business in Pittsburgh and that the Pittsburgh fabricators could do business in Chicago and that with elimination of the system, Chicago and Pittsburgh fabricators would meet between these two cities. This, in the view of Mr. Steinhauer, is an admission that not only does the Pittsburgh plus system substantially lessen competition, but it destroys it as to the Chicago fabricators in the territory east of Chicago, the territory of greatest consumption of their products. Even if Judge Gary had not made that admission, Mr. Steinhauer says, "there was still the admission of the president of the corporation, James A. Farrell, who stated that when the Pittsburgh plus system handicapped a manufacturer only 11c. per 100 lb., that manufacturer's business was doomed beyond the confines of his own home town."

Analyzing the situation with regard to the much discussed yellow territory, Mr. Steinhauer says this is the only territory where the Pittsburgh plus is offset for the Duluth manufacturer by the freight the Pittsburgh competitor pays on his finished product. In all other territory, it is contended, the Pittsburgh competitor has an advantage. This so-called yellow territory embraces the section where Chicago district steel mills receive their Chicago, or maximum price under the Pittsburgh plus system. The exhibits presented by the commission state the amount of the carload freight rate from Pittsburgh to Chicago, plus the rate from Chicago to any point in this yellow territory as the same as the through rate from the Pittsburgh to any such point. It is declared that the lack of growth on the part of the Chicago manufacturers as compared with their Pittsburgh competitors is due to nothing else than the Pittsburgh plus system.

Called Interminable Net Work

The brief attempts to show that Judge Gary did not always have a clear conception of the operations of the Pittsburgh plus base. In this connection, the brief says:

"It is amazing to think that Judge Gary could not have known that the Pittsburgh plus system is nothing else than an interminable network of discriminatory prices from the Chicago mills to their customers. No two steel customers whose freight rates from Pittsburgh differ get the same steel price from the Illinois Steel Co. That company does a large business in Cincinnati, Detroit, throughout Michigan and Indiana, where it prodigally discriminates away all its plus to its unduly favored customers.

"Judge Gary's ignorance of the inexcusable injustice wrought the corporation's mistreated customers should mitigate criticism of him up to the day that he discovered the injustice, but he must be held equally accountable with all his associate steel producers for the Pittsburgh plus which has continued since that time, and still continues, on wire products and on sheets and tin plate, in every corner of the country, and on plates, shapes, and bars and other articles, wherever it continues in whole or in part."

In making reply to the contention that prices among steel producers are not uniform Pittsburgh plus prices, Mr. Steinhauer asks, "why is it of such vital importance for them all to have the same contract whereby the examiners are protected, as they should be, against any increase which might occur in the price of steel, but which contains a freak provision which it should not contain to the effect that if the railroads increased their charges for freight surplus, which the steel consumer does not want, and does not use, then he must pay more for his steel?"

Would Pay Freight

Mr. Steinhauer says that if the steel companies did not adopt this contract provision, a Chicago buyer would buy his steel always from Chicago if there was any question that railroad freights might rise, because when they rose his cost of getting steel would not be affected. But, Mr. Steinhauer argued that if he had bought this steel from a Pittsburgh steel company f.o.b. Pittsburgh, he would be obliged to pay the increased actual freight charge in having that steel hauled to Chicago. This would give the Chicago mills the business, it is maintained, and the Pittsburgh mills would be out of it. On a falling freight rate period, Mr. Steinhauer says, the contrary situation would arise. He attacks steel producers for their alleged use of the same freight rate book issued by the American Sheet & Tin Plate Co., and in taking up correspondence between steel companies, it is contended that they have a "grand, informal, detective system whereby a reported price cut is immediately followed by a direct letter to the company charged to be 'guilty.'"

In justice to the steel companies, however, Mr. Steinhauer says it must be admitted that these charges of price cutting are not well founded. He takes up different associations and bureaus among steel companies and attempts to prove that they are guilty of violating the Sherman law. It is sought to show that the Steel Corporation, while not actively in these associations, benefits by them and is equally responsible for their activities. Decisions of courts in trade associations and other cases are quoted in this connection.

At some length Mr. Steinhauer attempts to break down the contention that the method of quoting steel on a Pittsburgh base is built solely upon the law of supply and demand. At the outset, he explains events leading up to the abolition of the Pittsburgh plus in the South on shapes, bars and plates, and the establishing of the Birmingham differential. He also deals with the establishment of a Chicago base during the war on the same products.

Chicago and Pittsburgh Compared

In seeking to destroy the arguments that the Pittsburgh base is built upon the law of supply and demand, Mr. Steinhauer says that the record is full of facts and figures showing that there is no shortage of steel at Chicago, nor in the Western territory any more than in the Pittsburgh district. The capacity of the Chicago district mills during the period 1908-1923, he says, has not been increased to near the extent of the increase of capacity in the Pittsburgh district, "which, of course, hardly indicates a surplus in Pittsburgh, nor a shortage in Chicago, especially where the steel prices are so much higher and the production costs so much lower in Chicago than at Pittsburgh."

Dealing further with this point, the brief said:

"Commission's exhibit 6982 shows that the ratio of production of rolled steel by the eastern and western mills, respectively, to the total production of the country, from 1907 to date, has been practically identical. This exhibit is very interesting, as proving conclusively that when the Chicago mills are crowded, so are the Pittsburgh mills, and when the Chicago mills are idle, so are the Pittsburgh mills, yet Pittsburgh plus prevails during all of these periods. This picture, to our mind, resolves the supply-and-demand bugaboo into the scrap basket for all time. It shows that when the Pittsburgh mills close down for lack of orders, so do the Chicago mills. When Chicago consumers call for more steel than Chicago mills produce, so do Pittsburgh consumers call for more steel than Pittsburgh mills produce. In short, it shows that Chicago never has been dependent on Pittsburgh for a single pound of steel, any more than Pittsburgh has been dependent on Chicago and other sections for steel.

"Many witnesses testified that it was just as difficult to get steel in times of great demand from Pittsburgh as from Chicago. The vice-president of the Midvale company knew of only one year when it was necessary

for the Chicago consumers to get steel in Pittsburgh, and during that year, the Chicago mills did not charge Pittsburgh plus. These facts, too, hardly show that a shortage in the West could be blamed for these Pittsburgh plus prices."

Mr. Steinhauer says it is idle to assert that f.o.b. mill prices could possibly be discriminatory prices in every case where there was a different freight rate and a distant milling point and a customer's plant without proof that such a thing ever occurred, ever could occur, or what is more to the point, ever happened in the steel industry.

Among other points made to destroy the Birmingham differential, Mr. Steinhauer declares that the cost of producing steel at Birmingham is less than at any other point in the United States and he cites Judge Gary as authority for this statement. It is declared that the Birmingham cost is approximately 26 per cent lower than at Pittsburgh, yet the steel prices vary from the Birmingham differential of $5 above Pittsburgh, "to the extortion under the Pittsburgh plus system of $15.30."

Maintaining Extras

Attack also is made on the so-called uniformity in maintaining rates of extras. Turning to the law, the brief states:

"We submit that the evidence proves beyond a shadow of a doubt that the Pittsburgh plus system was finally universally adopted in 1903 for all parts of the United States, on bars and shapes and plates, solely for the purpose of fixing and maintaining prices at discriminatory levels, which gave all mills outside of Pittsburgh a higher price for their production, and which gave to Pittsburgh mills the entire country as their territory. We have shown that Pittsburgh plus was started by the tin mills in Indiana in 1900, not because price competition had anything to do with it but for other reasons, and purely arbitrarily. The same thing happened on tubes at about the same time. The record shows that the same thing happened on bolts and nuts within the past few years. Respondents have not introduced one iota of evidence to show that on any article of steel Pittsburgh plus prices were started naturally; on the contrary, we have shown specifically, definitely, and at great length that the system was started by artificial means and continued by the same means. As the system was essentially a price-fixing device in the early days, as conclusively proved, and as it still is in existence, and as there is no evidence to the contrary, the law will presume that its character as a price-fixing device has continued."

Brief of Western States Says Dissolution of Steel Corporation Is Not the Purpose

Consisting of three elaborate volumes, the brief of Middle Western States against Pittsburgh plus and as a "friend of the court" also has been filed. Another brief to be filed in oppositon to the Pittsburgh-plus practice is that of the Duluth City Association.

The brief of the Middle Western States, including Illinois, Iowa, Minnesota and Wisconsin, was prepared by Attorney H. G. Pickering, who represents the States in the case, and the States themselves appeared on behalf of the Associated States Opposing Pittsburgh Plus. Mr. Pickering goes over the case in a most searching manner from its inception, but generally the trend of his brief is like that of the Federal Trade Commission's brief filed by Mr. Steinhauer. The brief of Mr. Pickering, however, is even more detailed in description and argument than that of Mr. Steinhauer. His citation of laws and decisions follows rather closely those cited by Mr. Steinhauer in an effort to show the Pittsburgh plus practice is illegal. Mr. Pickering at length discusses his conception of lessening competition, the character of the Pittsburgh plus, development of markets, how markets are made, the so-called marginal principal, and supply and demand. He especially emphasizes the economic phase of the question as he sees it and in applying his conception strongly attacks the Pittsburgh-plus practice as being unsound. In stating steel prices, Mr. Pickering says that "As evidence of the prices themselves and the character of such prices the trade journal excerpts are admissible and of the highest probative value. He refers frequently to prices quoted by THE IRON AGE and other journals. It is declared that the general purport of trade journal evidence in the case is that buyers and sellers generally in the trade get their price information from the prices quoted in these trade journals; "that they find them accurate and reliable; that the actual sales prices at which contracts are made check up absolutely with the prices quoted in the trade journals as of the date of the contract; that the trade journal quotations are used in the trade for the purpose of checking prices; that contracts for future delivery are based upon prices to be determined by reference to the quotations current in the trade journals at the time of delivery."

The testimony of A. I. Findley, editor of THE IRON AGE, as to the method of obtaining both prices and historical information, including the statement that news of association meetings was obtained by representatives who attend the meetings, is reviewed.

Testimony of Professors

Mr. Pickering's conception of what makes a market, the law of supply and demand, and the operation of the Pittsburgh plus system tallies closely with that expressed by Dr. F. A. Fetter of Princeton University; Prof. John R. Common of the University of Wisconsin and Prof. William Z. Ripley of Harvard University. An abstract of their testimony has been published in THE IRON AGE. Mr. Pickering, agreeing with their views, declares that "The Pittsburgh plus price is a hybrid. It is not an f.o.b. mill price. It is not even an f.o.b. Pittsburgh price. It is not, in the strict sense of the term, a delivered price." After defining his view of each of these methods, Mr. Pickering says that the benefits accruing to the mill from the Pittsburgh plus are the privilege of routing material, relief from responsibility for the material in transit, relief from tying up money in prepaid freight and the advantage of being able to establish a single quotation at any given time which is good for any customer irrespective of his location. Like the commission brief, that filed by Mr. Pickering urges f.o.b. mill quotations.

Steel Corporation Not a Monopoly

"It is not charged here," says the brief, "that the United States Steel Corporation is a monopoly. The prosecution of this proceeding is not an act *lese majeste* to review the case of U. S. vs. U. S. Steel Corporation. It is not charged that the practice is imposed upon the steel trade by any coercion or intimidation on the part of the respondents. It is charged adherence to the practice by the dominant producer in the trade, with a mill at every important steel center, is an inducement to the adherence to the practice by all other producers of steel, and that the general adherence to it by all eliminates competition among sellers, lessens competition between the mills, to the extent that they are also fabricators, and their fabricator customers, lessens competition between fabricators, and enhances the price of rolled steel and the price of indispensable commodities made therefrom.

"In short, it is charged that the Pittsburgh plus practice is a monopoly and it is the Pittsburgh plus practice and not the Steel Corporation that is on trial.

"This proceeding does not aim at the dissolution of the United States Steel Corporation. It does aim at the dissolution of the Pittsburgh plus practice."

Eleven hundred legally indentured apprentices in Milwaukee foundries and machine shops were entertained at a dinner attended by more than thirty presidents, managers, works managers or superintendents of employing concerns on Monday evening, May 5. It was the second dinner of this character given by the Milwaukee Metal Trades and Founders Association to inculcate appreciation of the benefits of the Wisconsin apprenticeship law and get valuable contact between apprentices and employers.

Triple Supply and Machinery Convention

(*Continued from page* 1572)

Ackles, T. B. Rayl Co., Detroit; first vice-president in charge of machine tool section, T. W. Carlisle, Strong, Carlisle & Hammond Co., Cleveland; second vice-president, E. P. Wells, C. H. Besly & Co., Chicago; executive committee, W. A. Somers, Somers, Fitler & Todd Co., Pittsburgh, and J. C. Richardson, Queen City Supply Co., Cincinnati; secretary and treasurer, George Fernley; advisory secretary and treasurer, T. James Fernley.

Machine Tool Section

TOPICS of interest to the machinery dealers were discussed by the machine tool section of the National Supply and Machinery Dealers' Association, which held two sessions. Remarks were made at the opening session by President W. J. Radcliffe, who was followed by the chairman, L. H. Swind, Swind Machinery Co., Philadelphia.

Mr. Swind, in referring to business conditions, thought that the next three or four months should show some revival in machine tools. He felt that it was unfortunate for business that the President is just now deprived of the right kind of team work on the part of Congress.

Classifying Used Tools

Mr. Swind suggested that the National Machine Tool Builders' Association establish a committee on classification of used tools, so that the buyers may be fully informed as to the characteristics of second-hand machine tools available. The classes would be as follows: Class A, which would include strictly up-to-the-minute standard or single purpose machines to be subdivided under two headings, standard A and production A. The term standard would apply to geared head and quick change feed machines, while production would apply to single purpose machines of recognized makes. Class B would cover all cone drive machines and class C, designs and types of machines that prevailed in 1914 or prior thereto. He said the plan would require the cooperation of the machine tool builders and that it might result in the curtailment of ill-advised purchases. He believed the trade publications could be of assistance to the machinery trade in making comparisons of the operations of old type and new type tools and in helping to educate consumers to use class A tools.

Certificates for Machinery Salesmen

Another suggestion made by Mr. Swind was that a system of certification be provided for sales engineers in the machinery field. He pointed out that there had been a large increase in the selling branch of the industry and many machinery salesmen lack proper training. In order to extend proper recognition to those having long training he suggested that the conference committee be instructed to discuss the subject with the National Machine Tool Builders' Association for the purpose of establishing a registry board authorized to pass on qualifications of salesmen. His plan would be to issue certificates to machinery salesmen having ten years' continuous experience in selling recognized tools and to others meeting machinery builders' requirements of eligibility. Such a plan he thought might result in a better class of salesmen and increase the salesmen's prestige.

Among other suggestions made by the chairman was that increased price differentials be allowed to dealers in remote parts of the country, particularly the Pacific Coast. This led to expressions of views from some of the dealers that any increase in differentials should apply to dealers at all points. Communications were read from the National Machinery Dealers' Association of Los Angeles and the National Machinery Dealers' Association of San Francisco declaring that the average 12 per cent commission for machinery dealers is insufficient. It was pointed out that the Pacific Coast dealers cannot sell machines in batteries in their field, the selling points are at long distances from both Los Angeles and San Francisco, large stocks of parts have to be carried, and because of other reasons it costs much more to sell machinery on the Pacific Coast than in the East. The coast dealers thought their commission should be increased from 7½ to 10 per cent.

Mr. Radcliffe offered a motion which was adopted that when machinery manufacturers find they can change prices to users they should take into consideration a price change to dealers, also considering in this connection that cost of doing business is increasing. In adopting this motion the dealers had in mind the securing of a little larger commission when price changes are made. The subject was referred to the conference committee to take up with the National Machine Tool Builders' Association at its Buffalo meeting.

Taking Used Tools in Trade

In discussing the best method of handling customers who wish to trade in used tools the plan that is being adopted by a Philadelphia machinery house was described. This dealer will suggest, when a customer has a used tool to trade in, that this tool be sent to a public auction place where tools will be auctioned off every week, and here it will be sold at a price not below that agreed upon by the owner and auctioneer. In case a purchaser is not found the tool will be offered during two or three following weeks and the owner is to pay storage rates upon it. Several machinery dealers expressed opposition to taking old tools except when they could be resold at a profit. One dealer reported a plan he has in effect of not allowing a salesman to have more than one used tool on the floor at a time, requiring the salesman to sell this tool at a profit before he is allowed to take another used machine in on a trade deal.

Other topics discussed at the machine tool section included cost of selling and expense of rendering service to the purchaser, conditions which may arise in connection with conditional sale contracts, how customers should be advised as to depreciation on tools, most effective advertising methods for machine tool dealers, methods of training sales engineers, and general conditions respecting new machine tools carried in stock by the dealer.

Separate Machine Tool Dealers Association

AN outcome of the joint meeting at Cleveland, May 19-21, of the National Supply and Machinery Dealers Association, the American Supply and Machinery Manufacturers Association and the Southern Supply and Machinery Dealers Association was the taking of steps to organize a new body to be composed exclusively of machine-tool dealers as distinguished from supply houses. Representatives of 35 machine-tool merchants participated in the conferences on the subject at Cleveland and J. R. Porter, Marshall & Huschart Machinery Co., Chicago, was appointed chairman of an organization committee which will perfect details for the formal launching of the new association. Membership will be confined exclusively to machine-tool dealers, and when a company is engaged both in the machine-tool and the supply business an officer identified with the machine-tool department will act as representative in the new organization. Attendance at meetings will be confined entirely to officers of member companies, in other words, to men who are in a position to speak

authoritatively for the houses they represent. A name for the new body has not yet been decided upon, although Machine Tool Distributers Association has been suggested. The new organization is recommended on the basis that the interests of the supply and machine-tool dealers are diverse and that problems can better be handled in separate bodies. The move is reported to have the support of the machine-tool builders.

American Supply and Machinery Manufacturers' Association

FIVE industrial groups were formed within the American Supply and Machinery Manufacturers' Association. Chairmen were reported and the joint sessions were conducted under their direction each afternoon. The groups included belting and transmission, general supplies, machinery and equipment, pipe and fittings and small tools. Group chairmen held an executive session Monday in conjunction with the executive committee.

JOHN C. RUF, PRESIDENT

The first general meeting of the association was held Tuesday morning, during which President Joseph M. Hottel, Delta File Works, Philadelphia, presented his annual address. He declared that the group plan was proving a great success and expressed the hope that such a plan would be followed at future conventions. Secretary-Treasurer Fred D. Mitchell reported the association in a healthy financial condition. He urged that no discrimination be shown in the matter of cash discounts, saying that it is unfair to grant concessions to one consumer merely because he is a large buyer. He advised uniform discount contracts in the interest of ethical business conduct. On behalf of the organization Mr. Mitchell expressed appreciation for the publicity accorded by trade journals which he said had helped the association in interesting new members. Robert B. Skinner, Skinner Chuck Co., New Britain, Conn., reported as chairman of the membership committee that 35 members had been added.

At the closing session Wednesday officers for the ensuing year were elected as follows: President, John C. Ruf, I. B. Williams & Sons, Dover, N. H.; first vice-president, H. D. North, Ferry Cap & Set Screw Co., Cleveland; second vice-president, W. R. Simpson, American Pulley Co., Philadelphia; third vice-president, Don S. Brisbin, Columbus-McKinnon Co., Columbus, Ohio; secretary and treasurer, Fred D. Mitchell.

Following the election, Mr. Hottel, the retiring president, was presented with a gold watch. Dixon C. Williams, Chicago Nipple Mfg. Co., paid tribute to the retiring and incoming presidents and expressed the belief that the group plan started this year would prove of great value. N. A. Gladding, E. C. Atkins & Co., Indianapolis, Ind., said that the group plan was one of the best innovations of any administration, in that it has renewed the interest of the members and should be a great factor in the association's work.

Southern Supply and Machinery Dealers' Association

AT the opening session of the Southern Supply and Machinery Dealers' Association, Chairman James Biggs, Hardwicke-Etter Co., Sherman, Tex., outlined his work during the past year as association president, and Alvin M. Smith, Smith-Courtney Co., Richmond, Va., read his annual report, which showed the organization to be in good condition. Sentiment was expressed against the soldiers' bonus and against the pending Howell-Barkley railroad bill.

J. H. McKinnon, Cameron & Barkley Co., Jacksonville, Fla., started a general discussion with a recommendation that manufacturers who furnish catalogs and price sheets for salesmen's books be requested to furnish these unpunched and of a size that will fit the largest books and with a sufficient margin to permit trimming down to fit the smallest books in use. The subject was referred to a committee for investigation.

At the second session of the association, held Tuesday, the question whether jobbers' salesmen should take part in the conventions was one of the topics. It was agreed that the meetings are for executives and that salesmen should not be present. It was urged, however, that salesmen should attend conventions of their customers in order to learn more intimately of the customers' requirements. It was the opinion that unless a jobber is prepared to sell on a national basis he should restrict his advertising to direct mail and catalogs. Companies equipped to sell from coast to coast and desiring to develop such a territory should use national publications devoted to their field. The establishment of manufacturers' branches in a jobbers' territory was considered a menace to dealer distribution and this was pointed out as a factor which increased the manufacturer's cost of operation without enlarging the sales and at the same time limiting the sales possibilities of the jobber in that territory who is carrying stock. The question whether the manufacturer should pay for space in the jobbers' catalog was deemed a matter of individual arrangement to be determined in each case by the jobber.

At the Wednesday session the following officers were elected for the ensuing year: President, J. L. Pitts, Brown-Roberts Hardware & Supply Co., Alexandria, La.; first vice-president, George Winship, Fulton Supply Co., Atlanta, Ga.; second vice-president, L. J. Larzelere, Farquhar Machinery Co., Jacksonville, Fla.; secretary-treasurer, Alvin M. Smith, Smith-Courtney Co., Richmond, Va. The new executive committee consists of James Biggs, chairman; R. P. Lockett, A. M. Lockett & Co., New Orleans; W. E. Gilkeson, Bluefield Supply Co., Bluefield, W. Va., and J. B. Rice, Hyman Supply Co., Wilmington, N. C.

Youngstown Steel Car Co. Earnings

In submitting to stockholders the company's 1923 financial statement, President William Wilkoff of the Youngstown Steel Car Co., Niles, Ohio, states: "At the date of this communication we have orders in process aggregating $1,500,000, which is especially gratifying in view of the general business slump throughout the country at the present time."

"The year 1923," he adds, "so far as it pertained to the car manufacturers, could be called a buyers' year, resulting in highly competitive contracts. It is to be regretted that our company experienced a loss for the year, but we are consoled by the fact that we fared well in comparison with most other car manufacturing companies."

The statement shows a net loss for 1923 of $10,772.44, and reveals the following exhibit: net sales, $2,821,635.72; cost of sales, $2,659,615.87, leaving a manufacturing profit of $162,019.85. Selling expenses totaled $35,779.29; general and administrative, $104,801.96. Interest and other deductions made the net loss.

Plans of New Companies

The Axle Bearing Corporation, 116 West Thirty-ninth Street, New York, has been incorporated with $300,000 capital stock to manufacture a new design of axle bearing. Preliminary work is in charge of the Teetsow-Drysdale Engineering Corporation. The company plans an initial production of 100,000 sets per year and it will likely do its own manufacturing. The officers are Dr. H. P. Jacobsen, president; Albert J. Clark, secretary; J. B. Stearns, treasurer, and W. H. Teetsow, formerly connected with the United States Ball Bearing Mfg. Co., Chicago, as works manager, is vice-president.

The Griffin Double Tread Wheel Co., 27 William Street, New York, incorporated with $250,000 capital stock, will manufacture steel wheels and rims. Plans are not yet definitely known, but the principals of the company are connected with the Griffin Chilled Steel & Iron Co., 27 William Street.

The Nightingale Cabinet Co., 543 Union Street, Brooklyn, has been incorporated with $20,000 capital stock to manufacture talking machine cabinets. It has taken over a plant and is now in operation. J. J. Traub and J. Cohn are the incorporators.

The Keen-Edge Knife Sharpener Co., 128 University Place, New York, incorporated with nominal capital, will manufacture knife sharpeners and other hardware products, beginning business in a small way. C. Roth and H. Greene are the incorporators.

The Johnson Oil Burner Co., Brooklyn, has been incorporated with $20,000 capital stock to manufacture oil burners, but will confine present activities to the installation of oil burning equipment. It will likely act as representative for manufacturers. Temporary address is in care of B. H. Feuer, 150 Broadway, New York.

The Ponsell Floor Machine Co., 220 West Nineteenth Street, New York, has been incorporated with $250,000 capital stock to manufacture floor cleaning machinery, having taken over the assets and business of the International Floor Machine Co., which has been established for over 11 years. Business will be continued as before.

Pryko, Inc., 39 Cortlandt Street, New York, recently incorporated with $50,000 capital stock, will manufacture steam traps. Operations are now under way in the company's plant in New Jersey. W. S. Koithan and R. W. Pryor, Jr., head the company.

Delway Burners, Inc., New York, recently incorporated with capital stock of $250,000 will manufacture oil burning apparatus. The product is now being manufactured under contract and will be on the market soon. Present address is in care of Bruno Weyers, 165 Broadway.

Harry Brainum, Jr., Inc., has been organized with $100,000 capital stock to continue a business in the manufacture of sheet iron products. Headquarters will be at 32 Richardson Street, Brooklyn.

The Fisher-Smith Roofing Corporation, 500 Fifth Avenue, New York, incorporated with capital stock of $25,000, plans to produce a roofing application. H. E. Fisher and A. W. Smith, Jr., are the principals.

The William H. Norden Co., 30 Church Street, New York, has been incorporated with capital stock of $25,000 and will act as distributor of road building machinery. It now represents the C. L. Best Tractor Co. and may take on other lines later.

The Poole Mfg. Co., Stanford, Conn., has been incorporated with $100,000 capital stock to manufacture a patented electric clock. It is planning to have its product on the market at an early date. The New York office is in care of Hastings & Gleason, 258 Broadway.

The Berger Auto Signal Device Co., Bronx, New York, incorporated with $25,000 capital stock will manufacture automobile signal equipment. It is now concerned with completing organization matters. Address is in care of W. H. Darrow, 79 Wall Street, New York.

The Fort Wayne Oil Heater Co., Fort Wayne, Ind., has been organized to install automatic oil burners and oil burner equipment. Ely E. Perry heads the company.

The Flint Malleable Castings Co., 313 Dryden Building, Flint, Mich., incorporated with $500,000 to manufacture malleable castings, will likely build a plant and have it in operation before the end of the year, although plans are not definitely concluded. J. M. Barringer is one of the principals.

The Wedberg Concrete Corporation, 708 Rogers Avenue, Brooklyn, has been incorporated with $1,400,000, Delaware laws, to manufacture a new system of concrete forms, and its intention is to establish a factory in the Central States. Axel G. W. Wedberg is president; Carl E. Josephson, secretary, and Oscar Palmleaf, treasurer.

The Ferro-Co Corporation, Wythe Avenue and North Thirteenth Street, Brooklyn, has been organized to take over the plant and organization of the Ferro Products Co., whose business it will continue. It has assumed all assets and liabilities of the former partnership of E. P. Larkin and Howard Fitzpatrick, the latter having sold out his interest. Mr. Larkin will be vice-president and treasurer of the new company and A. D. Mellor, formerly of Mellor & Hamburger and secretary of the Supro Building Products Corporation, is president.

The American Etherphone Corporation, 39 West Milwaukee Avenue, Detroit, has been organized to take over the business of the Radio Apparatus Co., manufacturer of radio equipment, whose factory and equipment will be used to continue operations. J. W. Keenan is president.

Ferguson Gear Co., Gastonia, N. C., incorporated with $100,000 capital stock, has installed machinery in a new factory recently completed and will manufacture all kinds of gears. The officers are Richard Ferguson, president and treasurer, and R. S. Ferguson, secretary.

The Stiner Piston Ring Co., 535 West Larned Street, Detroit, has been incorporated with $50,000 capital stock and will manufacture piston rings. It has plant and equipment for present needs. J. R. Beadle, E. Stiner and J. S. Vincent are the principals.

Trade Changes

The Buffalo Forge Co., Buffalo, announces the opening on June 1 of a Western office at Seattle, Wash. The territory of this office will include Oregon, Idaho and Montana, in addition to Washington and Alaska. Arthur T. Forsyth of the Buffalo plant will be in charge.

The Milwaukee sales office of the Concrete Engineering Co. has been moved from the Colby-Abbot Building, 445 Milwaukee Street, to 1005 Bartlett Building, 130 Grand Avenue.

The Edward Valve & Mfg. Co., East Chicago, Ill., now is represented in the New York district by the Dunbar Engineering Co., 50 Church Street, New York.

William Swindell & Brothers announce the removal of general offices on June 1 to their new office building on Freeport Road near Aspinwall, Pa.

Ludwig Hommel & Co., Pittsburgh representative of the Wagner Electric Corporation, will be located at 929 Penn Avenue, Pittsburgh, after May 31.

Charles Hardy, Inc., 100 East Forty-second Street, New York, has been appointed exclusive representative in the United States and Canada for the Ferro Manganese Gemeinschaft (Association), selling through the Gutehoffnungshutte Oberhausen, Germany, the ferromanganese produced there for export. Mr. Hardy states that shipments are again possible and that contracts now may be entered into with the assurance of fulfillment in every respect. The German product is guaranteed 76 to 80 per cent, with a maximum of 4 per cent phosphorus.

The H. S. B. W.-Cochrane Corporation, Philadelphia, has changed its corporated style to the Cochrane Corporation, manufacturer of water heaters, softeners and filters, flow meters, valves, traps, steam and oil separators, etc.

The Cleaton Co., Ltd., Eastern Canadian representative of the Conveyors Corporation of America, 326 West Madison Street, Chicago, has moved to 1070 Bleury Street, Montreal, Quebec.

The Vanadium Alloys Steel Co., Latrobe, Pa., announce the removal of the New York office to 270 Madison Avenue. J. H. Roberts is eastern manager of sales.

The Diamond Power Specialty Corporation, Detroit, manufacturer of Diamond soot blowers for water tube and horizontal return tubular boilers, has appointed W. L. Sullivan, 505 Central National Bank Building, Tulsa, Okla., as representative for Oklahoma.

The Niagara Falls Smelting & Refining Corporation, Buffalo, has appointed C. W. Leavitt & Co., New York, selling agents for silicon copper and manganese copper, in the territory east of the Mississippi River.

The Beck & Corbitt Iron Co., St. Louis, has changed its name to the Beck & Corbitt Co.

Manning, Maxwell & Moore, Inc., New York, has changed the address of its Cleveland office from the Huron Brick Building to 402 Swetland Building.

The United Alloy Steel Corporation, Canton, Ohio, announces the removal of its Chicago office to 1440 Straus Building, corner Jackson and Michigan Boulevards, in charge of L. K. Townsend, district sales manager.

Machinery Markets and News of the Works

UNION PACIFIC BUYS

Railroad Issues Orders for About 40 Machine Tools

Southern Railway Has Sent Formal Orders for Fully $200,000 Worth of Equipment

Railroad buying and inquiry comprise the only noteworthy features of the machine-tool markets. The Union Pacific System has placed orders at Chicago for about 40 machine tools, and it is intimated that inquiries will be sent out shortly covering requirements of a subsidiary road. The Southern Railway, whose recent purchases will total $200,000 or more, has sent out formal orders and has issued a new inquiry for 18 tools. The Chicago, Burlington & Quincy is expected to close shortly on its list for the Galesburg, Ill., shops and buying by the Atchison, Topeka & Santa Fe is also expected to begin shortly. The Norfolk & Western will probably take action on its extensive list within a week or two. The New York Central is buying from time to time, but its orders are scattered.

In general, however, machine-tool buying drags seriously, the falling off in volume in recent months having been so marked as to be a principal topic of comment at the meeting of the National Machine Tool Builders' Association at Buffalo last week.

Industrial companies are doing very little buying, except for occasional purchases by some of the automobile companies.

The largest inquiry in the Cincinnati district is from the Roosevelt Manual Training School, Dayton, Ohio, which asks prices on about 30 machines.

Used machinery continues to move much more actively than new tools, the tendency of many buyers being to hunt for "bargains."

New York

NEW YORK, May 27.

FORMAL orders for machine tools have been received by several companies from the Southern Railway whose total purchases are estimated to total $200,000 or more. This is the largest buying done recently in the East. Inquiries continue to come from the New York Central, usually one or two machines at a time, and that road has bought a 2500-lb. steam hammer. The Erie Railroad has purchased an axle lathe. Action is expected within a week or two on the list of the Norfolk & Western Railroad. Buying of tools by industrial companies continues in very light volume and there are no outstanding inquiries from such sources.

H. S. Andrews, Commissioner of Public Works, Fulton, N. Y., will take bids until June 6 for one complete steam-operated pumping unit, capacity 4,000,000 gal. per day, to be horizontal cross-compound crank and flywheel condensing type, to operate under a pressure of 80 lb. per sq. in., as per specifications on file.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until June 3 for 32,000 condenser tubes for the South Brooklyn Navy Yard, schedule 2222.

The secretary, Public Works Supplies and Tenders Committee, Wellington, New Zealand, will receive bids until July 29 for water turbines and electric generators with accessory equipment for the Lake Colerdige power station; also for riveted and welded pipe for this project.

H. Waterman & Brother, 195 Lewis Street, New York, manufacturers of gas stoves, burners, etc., have engaged W. H. Warnecke, 58 East Forty-ninth Street, architect, to prepare plans for extensions and improvements in the four-story building at 811-17 East Ninth Street, recently acquired for a new plant.

E. C. Sherwood, 50 Church Street, New York, railroad contractors' equipment, is in the market for a standard gage, all-steel spreader car, about 100,000 lb. capacity, Jordan type.

Edward P. Doyle, 11 John Street, New York, architect, has plans for a two-story automobile service, repair and garage building, 120 x 160 ft., at Washington Avenue, 185th to 186th Street, to cost about $250,000 including equipment.

The Industrial Machinery Division, Bureau of Foreign and Domestic Commerce, Washington, has information regarding metal-working machinery required by a European Government. The list includes a No. 2 universal miller having a 12 x 45 in. table; a universal tool-grinder for tools up to 12 in.; a drill press with 1-in. maximum bore; planer, with working length about 60 in.; punch for metal sheets of 1/16-in. thickness, and for holes 7 in. diameter; cold saws with moving length of about 20 in.; small turning lathe, to handle material up to 1½ in. diameter; hardening machines, with raw oil heating hardening chamber, about 24 in. long, 16 in. wide, and 13 in. high. The information is given in special circular No. 409.

The Board of Supervisors of Saratoga County, City Hall, Saratoga Springs, N. Y., J. R. Whitney, clerk, will receive bids until June 17 for a hydroelectric power plant, pumping plant, power dam, elevated steel tank, electric motors, transmission line and auxiliary equipment for the Homestead Sanitarium, Providence, as per plans and specifications on file, or at the office of the Utilities Engineering Co., 467 Broadway, Albany, N. Y., engineer.

M. F. Westergren, Inc., 213 East 144th Street, New York, manufacturer of sheet metal products, has filed plans for a four-story addition, 28 x 100 ft., to a two-story works at 231-35 East 144th Street, to cost $40,000. Albert E. Davis, 258 East 138th Street, is architect.

Following the purchase of the plant of the Ajax Rubber Works, Leyland, Lancashire, England, the B. F. Goodrich Rubber Co., 1780 Broadway, New York, has arranged a fund of about $250,000 for extensions and improvements, with the installation of considerable machinery for the manufacture of tires and mechanical rubber products. It is expected to operate the works by a subsidiary English company to have a working capital of $1,250,000.

The Auto Strop Safety Razor Co., 656 First Avenue, New York, has purchased property at 960-90 Frelinghuysen Avenue, Newark, as a site for a new plant to manufacture safety razors and blades, for which plans will soon be drawn.

The New Jersey Fire Escape & Railing Co., 118 First Street, Passaic, N. J., is having plans drawn by F. Pirrone, 104 Midland Avenue, Garfield, N. J., architect, for a one-story works, 80 x 100 ft., at 135 Main Street, Hackensack, N. J., to cost about $32,000.

The Board of Education, Passaic, N. J., has authorized plans for a local vocational trades school and is arranging with the Board of City Commissioners for an appropriation for the establishment, including the purchase of equipment. It is purposed to have the institution ready for service in the fall.

Peter Wendel & Sons, Inc., 171 Badger Avenue, Newark, manufacturer of wagon and automobile bodies, etc., has acquired a two-acre tract at Frelinghuysen Avenue and Victoria Street, as a site for a new plant for which plans will soon be prepared. It is proposed to remove the present works

to the new location and install considerable additional equipment.

The Board of Education, Essex County Vocational Schools, 475 High Street, Newark, will take bids until June 9 on a general contract for a three-story and part basement vocational school, 103 x 136 ft., at Irvington, N. J., complete with mechanical equipment. Plans and specifications on file at the office noted, or at the office of Guilbert & Betelle, Chamber of Commerce Building. Robert C. Beebe is director of the school board.

The Board of Aldermen, Morristown, N. J., is considering plans for the installation of electric-operated pumping equipment at the municipal waterworks to replace steam-driven apparatus.

The Yu-Chu Co., 329 Broad Street, Newark, N. J., recently incorporated, is desirous of contracting for the assembling of its gum vending machines in lots of 5000. J. E. Hartle, Jr., is one of the principals.

Philadelphia

PHILADELPHIA, May 26.

CONTRACT has been awarded by the Electric Storage Battery Co., Nineteenth and Allegheny Streets, Philadelphia, to the William Steele & Sons Co., 219 North Broad Street, for an addition to its plant to cost $45,000.

David P. Austin, Philadelphia, has awarded a general contract to James T. Murphy, 1712 North Second Street, for a one-story machine shop at Hancock and Montgomery Streets.

Kepple & Co., Chester, Pa., have inquiries out for a return tubular boiler, 18 x 72 in., and auxiliary apparatus.

The Moore Push Pin Co., 133 Berkley Street, Philadelphia, manufacturer of thumb tacks and kindred metal products, is taking bids on a general contract for an addition and alterations in the present factory, estimated at $40,000. The Ballinger Co., Twelfth and Chestnut streets, is architect and engineer.

Following the completion of a three-story pattern shop, the Link Belt Co., Hunting Park Avenue and Twenty-first Street, Philadelphia, manufacturer of conveying and elevating machinery, etc., is said to have preliminary plans for the erection of additional buildings to occupy the sites of the former pattern shop and other old structures.

The Wirt & Knox Mfg. Co., Twenty-third and York Streets, Philadelphia, manufacturer of axe brackets, machine equipment, etc., has awarded a general contract to the W. F. Newberry Co., Otis Building, for a two-story addition, 95 x 148 ft., estimated to cost $75,000 with equipment.

The Foreign Trade Department, Chamber of Commerce, Twelfth and Walnut Streets, Philadelphia, has received an inquiry from a company in Mexico desiring to purchase standard gage oil tank cars, storage tanks for oil and water, flat cars of standard gage and kindred equipment.

The O'Brien Machinery Co., E and Tioga Streets, Philadelphia, has filed plans for the erection of a new building for general operating and distributing service, estimated to cost $47,000.

H. G. Ley & Co., 115 Pearl Street, Camden, N. J., is in the market for a steam hammer, Vulcan type or similar, and pumping equipment for jet service.

The Board of Education, Upper Darby, Philadelphia, J. Milton Lutz, secretary, is considering the installation of a manual training department in its new high school on the Lansdowne-Darby Road, Upper Darby, estimated to cost $200,000, for which bids are being asked on a general contract until June 6. Horace W. Castor, Stephen Girard Building, Philadelphia, is architect.

The National Roofing Mfg. Co., York, Pa., has tentative plans for an addition to its mill at Cly, Pa., to be equipped as a beater department. Considerable machinery will be installed. It is also considering the installation of a new 84-in. paper machine and auxiliary apparatus later. John A. Young is president, and George Odewalt, vice-president.

Henry Levis & Co., Commercial Trust Building, Philadelphia, dealers, are in the market for a steam shovel, caterpillar tractor type; also, for 10 two-way dump cars, each about 8 yds. capacity, standard gage.

Officials of the Pennsylvania Water & Power Co., Holtwood, Pa., are organizing a company with capital of $3,500,000 to construct and operate a local-steam-electric generating plant, for which a site has been selected. It will be designed for an initial capacity of 20,000 kw. and is estimated to cost $2,500,000. The station will be extended later to an ultimate output of 100,000 kw. The first unit is to be ready for service during the coming year. The company will be operated by J. E. Aldred & Co., 42 Wall Street, New York, with J. E. Aldred, head of the Pennsylvania Water & Power Co., acting in the same capacity. The same interests also control the Consolidated Gas, Electric Light & Power Co., Baltimore, and are projecting a hydroelectric generating plant on the Susquehanna River.

Fire, May 23, destroyed the foundry and machine shop of the Franklin Valveless Engine Co., Franklin, Pa., entailing a loss of $140,000. It is planned to rebuild immediately and considerable equipment will be purchased.

Samuel Lininger, Grafton, Pa., is in the market for a tubular boiler and steam engine for a sawmill.

Manual training and vocational departments will be installed in two schools to be erected at Uniontown, Pa., for which a bond issue of $600,000 has just been authorized. The Board of Education is in charge.

Pittsburgh

PITTSBURGH, May 26.

MACHINE tool business still drags in this district in both inquiries and sales, but there has been some quickening in crane business and the placing of the electrical equipment for one of the new structural mills of the Carnegie Steel Co. at Homestead, has provided a feature to that division of the market. The placing of the structural mill is expected shortly, this unit consisting of a 44-in. blooming mill, a 36-in. intermediate and a 20-22-in. 3-stand finishing mill. Action on the several lists which have been before the trade for some time still is awaited.

The Fredericktown Coal & Coke Co., Fredericktown, Pa., is considering the construction of an aerial tramway system at Martin, Pa., for coal transportation.

The National Malleable Castings Co., Quincy Street and Woodhill Road, Cleveland, will soon begin the erection of a three-story building on South Dock Street, Sharon, Pa., estimated to cost $200,000.

The Tompkins Fuel Co., Cedargrove, W. Va., recently organized, has arranged an extension and improvement program at its mining properties, including the installation of steel tipples, shaker screens and other equipment. Harold P. Tompkins, Charleston, W. Va., is president, and Roger Tompkins, Cedargrove, manager in charge.

The Hillman Coal & Coke Co., First National Bank Building, Pittsburgh, has made application for extensions and improvements in its Ella tipple near Webster, including the installation of additional equipment.

The Board of Education, Parkersburg, W. Va., is planning the construction of vocational shops in connection with the erection of three new schools, for which a bond issue of $575,000 is being arranged.

C. W. Hancock & Sons, Bluefield, W. Va., contractors, are in the market for a portable gasoline air compressor, Ingersoll-Rand type.

The Pri-co Mfg. Co., Grove City, Pa., manufacturer of aluminum products, automobile equipment, etc., is said to be planning for the early purchase of several drill presses, lathes, woodworking and other machinery, for its new plant at Tidioute, Pa. E. B. Cook is general manager.

The South Pittsburgh Water Co., 238 Brownsville Road, Pittsburgh, has arranged a fund of $500,000, for extensions and improvements in waterworks and system, including the installation of additional pumping machinery and auxiliary equipment. The company is operated by the American Water Works & Electric Co., 50 Broad Street, New York.

The Mannington School District, Mannington, W. Va., plans the installation of a manual training department in the proposed high school, for which a bond issue of $200,000 has been approved.

Contract has been awarded to the H. K. Ferguson Co., Cleveland, for a three story and basement addition to the plant of the Wolverine Supply & Mfg. Co., Northside, Pittsburgh, to contain 38,000 sq. ft. of floor space and cost $250,000. New equipment will be purchased. B. F. Bain heads the company.

Robert W. Russell, St. Mary's, W. Va., is looking for the following used equipment for export, f.a.s. New York: 1500-lb. board lift drop press; ¾-in. hot swaging machine; two bolt heading machines, ½ to ¾-in. bolt; an alligator shear to cut ½ x 12-in. plates; scrap baling press, 12 x 6 x 6; three power hammers, 50, 100 and 150-lb.; a two-stage air compressor, 100 cu. ft. per min.; quick work rotary shear for ½-in. plates.

The Superior Steel Products Co., Beaver Falls, Pa., recently incorporated with $100,000 capital stock, has placed a contract for the steel work of a building now under construction. Contracts for various other items will be let shortly. The company will manufacture cold finished steel specialties. M. P. Simpson is president and F. H. Guppy secretary.

Detroit

DETROIT, May 26.

THE Watts Laundry Machinery Co., St. Joseph, Mich., has acquired the factory heretofore occupied by the Fruit Package Machinery Co. and will remodel for a new plant. It is said that the present works will be removed to this location. Plans are also under consideration for the erection of an additional unit.

The Detroit, Toledo & Ironton Railroad Co., Detroit, operated by Henry Ford, has acquired about 1300 acres near Springfield, Ohio, and is said to be planning to use a portion of the site for a new car repair shop estimated to cost $500,000. Another portion of the tract, it is stated, will be given over to a new assembling plant for the Ford Motor Co., with the removal of the present works at Columbus, Ohio, to this location.

The Dunn Sulphite Paper Co., Port Huron, Mich., has filed plans for the erection of the first unit of its proposed pulp and paper mill, estimated to cost $100,000 with equipment.

The Hupp Motor Car Co., 3501 East Milwaukee Street, Detroit, has awarded a general contract to the Everett Winters Co., Book Building, for two additions, each one-story, 50 x 150 ft. and 100 x 120 ft., estimated to cost 130,000. The first noted will be equipped for testing service.

Manual training equipment will be installed in the two-story high school to be erected at Wayne, Mich., estimated to cost $200,000, for which bids have been asked on a general contract. Former bids received were recently rejected. The Warren, Holmes, Powers Co., Tussing Building, Lansing, Mich., are architects.

The Universal Skidless Chain Co., Niles, Mich., has awarded contract to Frank S. Sturgis, Niles, for the erection of a factory, 60 x 160 ft., for which some new equipment will be required.

Rydberg & Olson, 820 Temple Avenue, Detroit, Mich., are in the market for several punch presses and hand lever bar shears.

Manual training and vocational departments will be installed in a new high school to be erected at Wakefield, Mich., for which the Board of Education is arranging a bond issue of $250,000.

The Unique Brass Mfg. Co., Detroit, will be in the market for equipment for a one-story drop forge plant addition, now under construction.

Buffalo

BUFFALO, May 26.

WITH local dealers taken up with the convention of the National Machine Tool Builders' Association the past week, business was somewhat below the average. No particular sales of machine tools are reported, and dealers are preparing to face a quiet summer.

The Upson Co., Lockport, N. Y., is inquiring for a used steel building, 45 to 60 ft. wide and 200 to 400 ft. long.

The Sterling Engine Co., 1250 Niagara Street, Buffalo, manufacturer of gas and gasoline engines, will build a one-story addition, 116 x 118 ft., to cost $68,000. The company has secured a large contract from the Government for marine engines. J. A. Criqui is president.

The Coplan Steel Co., Ogdensburg, N. Y., A. H. Coplan, head, has plans for a one-story foundry, 85 x 350 ft., to cost $70,000.

The Buffalo Sintering Co., Buffalo, has made application for permission to erect a new plant on Marilla Street, where site has been purchased, for the manufacture of metal products from iron bearing materials, too small for blast furnace operation.

The Standard Oil Co. of New York, 26 Broadway, New York, has acquired 300 acres on Grand Island, Buffalo, with river frontage of about 3000 ft., and is contemplating using the site for a new storage and distributing plant, with estimated cost of $100,000.

The W. N. Gardner Box Co., Lincoln Avenue, Tully, N. Y., has tentative plans for rebuilding the portion of its plant recently destroyed by fire with loss estimated at $50,000, including machinery. Headquarters of the company are at New Woodstock, N. Y.

The Macbeth Body Co., 218 Hurst Building, Buffalo, recently organized to manufacture automobile bodies, is said to have authorized plans for a one-story plant on Erie Avenue, North Tonawanda, N. Y., to cost approximately $100,000 with equipment. Frank W. Buse is president.

The Rochester Gas & Electric Co., 34 North Clinton Street, Rochester, N. Y., is said to be having plans drawn for a new steam-operated power house, to cost $300,000 including equipment. It will be used for heating service as well as steam power work.

Chicago

CHICAGO, May 26.

THE Union Pacific has placed orders for 40 machine tools, involving a total outlay of $150,000. These items are entirely for the Union Pacific Railroad proper and it is intimated that additional inquiries will shortly be put out for the subsidiary lines. An inquiry for a carwheel lathe for one of the subsidiaries is now current. The Burlington list for its Galesburg shops is expected to be closed soon and there also seems to be a fair prospect of early purchases against part of the pending Santa Fe inquiry. Generally speaking, the machine tool market is exceedingly quiet, and while a fair number of inquiries, both pending and fresh, are before the trade, few orders are actually being placed.

The Chicago Board of Education has made inquiry for a number of small items. For the Moreland Continuation School, 4720 West Ohio Street, it is asking for prices on a Mummert & Dixon, or equivalent, small manual training shop size, three wheel motor-driven grinder on stand, a type B S Syracuse, or equivalent, 20-in. motor-driven band saw with six extra ½-in. blades, a No. 211 Wells, or equivalent, manual training motor-driven lathe. For the South Chicago Continuation School, 9358 Houston Avenue, it is in the market for a portable motor-driven hollow chisel mortiser, similar to that manufactured by the Bracket Mfg. Co., Lancaster, Wis.

The Columbia Industrial Machine Co., 4020 West Lake Street, Chicago, has awarded contract for a one-story machine shop, 25 x 61 ft., and 23 x 51 ft., and a one-story garage, 10 x 30 ft., at that address, to cost $5,000.

The Bates Valve Bag Co., 7310 South Chicago Avenue, Chicago, has awarded a contract for a two-story factory, 120 x 140 ft., 8240 South Chicago Avenue, to cost $150,000.

The Elgin, Joliet & Eastern Railroad has started construction on a power house at Joliet, Ill., to cost $250,000.

The Des Moines Millwork Co., 808-14 Tuttle Street, Des Moines, Iowa, has started the construction of a one-story addition, 34 x 310 ft.

The Barnes Drill Co., Rockford, Ill., will build a two-story addition to cost $12,000. The front section will be used for office space and the rear for a shop.

The Bessemer steel foundry of the Walworth Mfg. Co., Kewanee, Ill., has been shut down and the patterns have been transferred to a Chicago foundry, where electric steel castings will be made.

The Kellogg-Mackay Co., manufacturer of boilers, radiators, heating equipment and plumbing supplies, will move its factory and office from 419 West Eighteenth Street, Chicago, to the Central Manufacturing District, where 70,000 sq. ft. of land has been purchased on Thirty-seventh Street at Loomis Place on the Chicago River. Three buildings, comprising factory and warehouse, will be constructed at a cost of $300,000. The general contract was awarded to the E. W. Sproul Co., Chicago.

The Fisher Governor Co., Marshalltown, Iowa, manufacturer of governors, regulators and other steam specialties, has asked bids on a general contract for its two-story and part basement addition, 60 x 125 ft., estimated to cost $40,000. J. H. Fisher is head.

The Board of Managers, State Soldiers' Home, Hot Springs, S. D., will take bids until July 8 for one engine and electric generator, about 70 hp., with switchboard and auxiliary equipment. Plans at the office noted or from the office of the State Engineer, Pierre, S. D.

Fire, May 19, destroyed a portion of the works of the Craig Oil Refining Co., St. Paul, Minn., with loss estimated at $250,000 including equipment. It is planned to rebuild.

The C. A. Dunham Co., Lincoln Highway, Marshalltown, Iowa, is taking bids on a general contract, to close about June 9, for a two-story addition, 50 x 125 ft., estimated to cost $55,000 with equipment. The company specializes in the manufacture of heating equipment and systems. H. E. Reimer, Marshalltown, is architect.

The Rockford Brass Works, Inc., Rockford, Ill., has

The Crane Market

INQUIRY for both electric overhead and locomotive cranes is light. While there are a fairly large number of inquiries current, purchasers are slow to make award. Among locomotive crane purchases is reported the award of two cranes by the Pennsylvania Railroad. The Chesapeake & Ohio Railroad closed on its three ditchers with the American Hoist & Derrick Co. but no action is yet reported on the locomotive cranes. Among current overhead inquiries is one from Rojo-Fabian & Co., 370 Broadway, New York, for a 20-ton, 57-ft. 5½-in. span, double trolley hand power crane for export to Porto Rico. An inquiry is current from a consulting engineer in New York for a 3-ton hand power crane for a pumping station, Keansburg, N. J.

In the Pittsburgh district, the Westinghouse Air Brake Co., Wilmerding, Pa., has issued through Bernard H. Prack, Keystone Building, Pittsburgh, a list of cranes, hoists and monorail. The American Sheet & Tin Plate Co. is expected to close soon for a 50-ton crane with 10-ton auxiliary, 80-ft. span for its Wellsville, Ohio, works and there are strong indications that the Carnegie Steel Co., will act soon on a couple of cranes for the new machine shop at its Homestead works. In addition, there are before the trade 12 cranes for the transformer plant of the Westinghouse Electric & Mfg. Co., Sharon, and 19 cranes for the Gary tube works of the National Tube Co. The Blaw-Knox Co., Pittsburgh, is in the market for a 5-ton trolley.

Among recent purchases are:

Northern Pacific Railroad, a 70-ton double trolley traveling crane and a 15-ton single trolley traveling crane for a boiler shop at Livingston, Mont., from the Shaw Electric Crane Co.

American Sheet & Tin Plate Co., Pittsburgh, a 15-ton, 58-ft. 6-in. span, overhead crane with a 5-ton auxiliary, for a green sand room of foundry, roll and machine works, Canton, Ohio, from the Cleveland Crane & Engineering Co.

Duquesne Light Co., Pittsburgh, a 10-ton overhead crane, from the Northern Engineering Works.

Utica Gas & Electric Co., Utica, N. Y., a 10-ton overhead crane and a 50-ton trolley, from the Northern Engineering Works.

Erie Steam Hammer Co., Erie, Pa., three 5-ton overhead cranes and a 25-ton crane with a 5-ton auxiliary, from the Northern Engineering Works.

A. M. Byers Co., Pittsburgh, telpher crane for its Girard, Ohio, works, from the Alliance Machine Co.

American Sheet & Tin Plate Co., Pittsburgh, a 15-ton trolley for its Shenango Works, New Castle, Pa., from the Alliance Machine Co.

Bourne-Fuller Co., Cleveland, a 10-ton electric traveling crane for its Cincinnati warehouse, from an eastern builder.

Dwight P. Robinson & Co., New York, have not yet closed on the bucket crane for the Mississippi Glass Co., as was erroneously reported last week.

awarded a general contract to the Holm-Page Co., Rockford, for a one-story foundry and finishing works, estimated to cost $75,000, including equipment. Work will begin at once.

The Great Northern Railway Co., Fifth and Jackson Streets, St. Paul, Minn., has plans for a new engine house with repair facilities at Williston, N. D., estimated to cost $35,000.

The Board of Water Commissioners, 1509 Cleveland Place, Denver, Colo., will take bids until June 6 for a new filtration plant at the city waterworks, to include an electric traveling crane, dry feed chemical machines, boilers and pumping machinery for approximately 700-hp. capacity, sand-washing apparatus, filter regulating apparatus, meter equipment. Burton Lowther is chief engineer and Frank L. Woodward is president of the board.

St. Louis

ST. LOUIS, May 26.

BIDS will be received by Fred Johnson, town clerk, Hartville, Mo., until June 11 for a municipal hydro-electric power plant, consisting of power dam and power house, one 42 kva. water-wheel driven, three-phase alternator, 60-cycle, 2300 volts; water wheel; one 25-hp. coal oil engine, belt-connected to a 25-kva. alternator, with switchboard and auxiliary equipment, including distributing lines. The Alexander Engineering Co., Woodruff Building, Springfield, Mo., is engineer.

The American Salt & Coal Co., Waldheim Building, Kansas City, Mo., is perfecting plans for a new salt-producing works at Lyons, Kan. The initial unit will be one, two and three-stories, 200 x 500 ft., estimated to cost $800,000. A power house and machine shop will also be built.

Earl G. Hastings, Tulsa, Okla., and associates, are organizing a new company capitalized at $1,000,000 to establish a plant for the manufacture of oil well tools and equipment, oil reamers, etc. Negotiations are in progress for taking over a local works on East Sixteenth Street which will be remodeled.

Fire, May 15, destroyed a portion of the municipal electric light and power plant at Garnett, Kan., with loss estimated at $80,000 including equipment. Tentative plans are under consideration for rebuilding.

The Common Council, Perryville, Mo., plans the installation of electric-operated pumping machinery in connection with the proposed municipal waterworks and sewerage system, for which bonds for $100,000 will be arranged. The Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

The Kansas City Can & Mfg. Co., Kansas City, Mo., has plans at the office of J. G. Braecklein, Federal Reserve Life Insurance Building, architect, for new works on the Fairfax and Diagonal Roads, to consist of a main one-story unit, 50 x 100 ft., and adjoining structures, 50 x 75 ft. and smaller, estimated to cost $80,000 with equipment.

The city clerk, Tucumcari, N. M., will take bids until June 14 for equipment for a municipal waterworks, including pumping machinery, valves, pipe lines and auxiliary equipment. The Weiland Engineering Co., Thatcher Building, Pueblo, Colo., is engineer.

The Inland Utilities Co., Elk City, Okla., recently organized, plans the installation of a local steam-operated electric power plant and system. The company will also operate a station at Hobart, Okla.

The Union Electric Light & Power Co., Cape Girardeau, Mo., contemplates the installation of additional equipment at its plant. H. B. Newman is manager.

The Board of Public Works, Hannibal, Mo., is asking bids until June 6 for equipment for waterworks extensions and improvements, including nine motor-driven centrifugal pumps, from 500 to 2500 gal. per min. capacity; electric switchboard, instruments and auxiliary equipment. The Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer, in charge. M. J. Regan is president of the board.

New England

BOSTON, May 26.

MAY will go down in business history as one of the leanest months ever experienced in the New England machine tool market. Sales the past week were few, some dealers not moving a single item. As previously reported, going business is practically confined to small and unimportant equipment. New inquiries are as limited as sales, and it is estimated that approximately 70 per cent of those received the past two months have been deferred until fall. Both new and used machinery houses continue to meet stiff competition from industries closing out surplus equipment. Notwithstanding the inactivity of business prices hold well. New England machine tool builders, collectively, are less active than a month ago.

Bids close next week for a manual training stock room for the Henry L. Pierce school, Dorchester, Boston. The schoolhouse department is taking the bids.

The Fitchburg Gas & Electric Co., 537 Main Street, Fitchburg, Mass., will install a new 8000 kw. Westinghouse turbine engine in its Wanoosnac Road plant. The Charles H. Tenney Co., 200 Devonshire Street, Boston, is the engineer.

Contract has been awarded for the erection of a junior high school at Malden, Mass., to cost 350,000 including equipment. It will be two stories, 76 x 150 ft. with small ell and will contain a manual training department. M. A. Dyer, 1 Beacon Street, Boston, is the architect.

Plans are in progress for a one-story, 31 x 55 ft. addition for the Lunch Car Co., 390 Main Street., Worcester, Mass.

Jasper Rustigan, 405 Main Street, Worcester, is the architect.

The Bridgeport Safety Emery Wheel Co., Bridgeport and Stratford, Conn., will erect a 90 x 240 ft. factory adjoining the present Stratford plant. When completed, the Bridgeport office and works will be moved to the new building.

The Worcester Parking Co., 507 Main Street, Worcester, Mass., has awarded a general contract to L. A. Scott & Co., Grand Central Terminal, New York, for a multi-story automobile service, repair and garage building to cost approximately $1,000,000 with equipment. John P. Kingston & Son, 507 Main Street, are architects. George M. Wright is president.

Fire, May 19, destroyed five shop buildings at the ship construction and repair yard of the Charles W. Morse Co., Noank, Conn., with loss estimated at $150,000 including machinery. The machine shop and galvanized plant were saved. No announcement has as yet been made regarding rebuilding. Harry F. Morse is general manager.

The Standard Oil Co., 26 Broadway, New York, has plans for a new oil storage and distributing station on the River Road, Middletown, Conn., estimated to cost $1,000,000 with machinery.

The August Schmelzer Co., Meriden, Conn., is having plans drawn by George P. Carver, Inc., 261 Franklin Street, Boston, engineer, for an elevated coal pocket, with elevating, conveying and other equipment.

The Mayfair Mfg. Co., 31 Milk Street, Boston, manufacturer of automobile equipment, contemplates the purchase of a number of tools, including cylinder and bench grinders, electric drills, air compressor, lathes, etc.

The Waterbury Farrel Foundry & Machine Co., Bank Street, Waterbury, Conn., is planning for a one-story addition, 60 x 100 ft., to cost about $45,000 with equipment. F. A. Webster, 51 West Main Street, is architect.

Milwaukee

MILWAUKEE, May 26.

WHILE, as a rule, the larger foundry and machine shops in this district are manifesting little or no interest in new equipment, occasional sales of one or two tools are reported. Buying has settled to a point where the barest needs only are being filled. There has been no interference in delivery specifications on orders placed with local toolbuilders in recent months. On the whole, matters are very quiet. Employment has suffered a further let-down, although the recession is more gradual. Inquiry is inactive. Used equipment is moving relatively better than new.

The Milwaukee Board of School Directors on May 20 called for bids for a small list of shop equipment for the Boys' Technical High School, 345 Virginia Street, for which bids close May 29. The board will be in the market, probably in August, for considerable miscellaneous equipment for an addition now being erected to the central repair and service shop at Eleventh and Prairie Streets. Specifications are not yet completed. Frank M. Harbach is business manager.

The Lucia Brothers Motor Car Co., Green Bay, Wis., distributor of Packard automobiles, has purchased the two-story garage, 66 x 159 ft., on Adams Street, and will take possession June 15, when it will be remodeled into a sales and service station, with a machine and repair department. A full complement of new equipment will be purchased.

The Power & Heating Appliance Co., 200-210 Pleasant Street, Milwaukee, specializing in the manufacture of steam traps, has incorporated the business under the same name with a capital of $100,000, all common stock. Additional floor space is being taken and some shop equipment will be installed. Frank L. Hutchinson, chief engineer, becomes president of the new corporation.

The Perfection Specialties Co., Elkhart Lake, Wis., a new corporation, has leased the Sinz Building on Rhine Street and will equip a machine shop to manufacture mechanical and electrical specialties for the automotive, radio and musical instrument industries. The first production will be a combination battery recharger and phonograph motor with a unique electrical valve or governor, perfected by George C. Trotter, president and general manager.

The Antigo, Wis., Board of Education has accepted the bid of J. P. Cullen & Sons, Janesville, Wis., to undertake the general contract on the new Antigo high and vocational school, estimated to cost $150,000 with full equipment. The architects are Claude & Starck, Madison, Wis. It is not likely that shop equipment will be purchased before early fall.

The Waupun Auto Sales Co., Waupun, Wis., which sustained a loss of $60,000 by fire on May 7, will not rebuild for the present but has leased a building at Fond du Lac and Main Streets, which it is remodeling into a salesroom, garage and service shop. All machinery requires replacement and inquiries will be made at once. Schuyler Brooks is president and manager.

Trustees of School District No. 4, Shorewood, Milwaukee County, accepted the bid of Paul Riesen's Sons Co., 1012 Humboldt Avenue, for the first unit of a new high school with manual training departments, estimated to cost $175,000. Four units are contemplated. The architects are Herbst & Kuenzli, 116-118 Grand Avenue, Milwaukee.

John B. Pirsch, 263 Exchange Street, Kenosha, Wis., conducting a general machine shop and automotive repair works, has incorporated as the Pirsch Motor Co., with $20,000 capital. William Riddel and Arthur J. Remmel have become interested. The shop is to be enlarged during the summer and some new equipment installed.

The Racine, Wis., Association of Commerce, F. H. Bartlett, commissioner, is negotiating with a Milwaukee group organizing the Schueler Motor Co., to manufacture gasoline engines and farm lighting systems, with a view of locating in Racine. Identity of the principals is withheld for the present. An existing building will be purchased and a plant established with new equipment throughout.

The Kenosha, Wis., Board of Education will close bids June 12 for the complete construction of a three-story high school, 250 x 265 ft., designed by John D. Chubb, architect, 109 North Dearborn Street, Chicago. Shop equipment will be purchased later. Ella F. Powers is secretary of the board.

The Milwaukee Central Board of Purchases, City Hall, is asking bids until June 2 for furnishing the new Riverside pumping station, municipal water works, one universal milling machine. Tenders will be entertained on both new and used equipment. Joseph W. Nicholson is in charge of purchases.

The Waupun, Wis., Board of Education has called for bids for the erection of a three-story addition, 50 x 81 ft., to the high school, part of which is to be equipped for vocational training. The architects are Stepnoski & Mehner, Fond du Lac, Wis. Bids will close June 2.

Cincinnati

CINCINNATI, May 26.

SCATTERED orders for single machines characterize activity the past week. The market is spotty, some manufacturers reporting receipt of orders while others state there is very little business. Inquiries continue good though it is still extremely difficult to close. The largest inquiry issued in this district was from the Roosevelt manual training school, Dayton, Ohio, for 30 miscellaneous machine tools.

The Pierce-Arrow Motor Car Co. bought five drilling machines and the Studebaker Corporation a large crankshaft lathe. The New York Central Lines placed several machines. The Norfolk & Western Railroad is expected shortly to commence the purchase of tools on its recent list, and the Sante Fe is expected to close for equipment for its San Bernardino shops this week. Used machinery is moving well, a local manufacturer having just purchased 10 machines.

The machine and carpenter shops of the Turner, Day & Woolworth Handle Co., Louisville, Ky., were damaged by fire May 17, the loss, including equipment being estimated at $25,000. The shops will be rebuilt.

The Springfield Spring Co., Springfield, Ohio, will erect an addition to its plant, 60 x 255 ft., one-story, to enable it to double its production of springs. Additional equipment will be necessary. Ralph Thatcher is manager.

The Ford Motor Co., has awarded a general contract for an addition to its Hamilton, Ohio, plant, which will provide 18,000 additional feet of floor space for the manufacture of small parts. Three hundred men will be employed in this department, bringing the total force to 2200.

The Ohio Pattern Works & Foundry Co., Cincinnati, has purchased property adjoining its plant on Spring Grove Avenue, and contemplates the erection of a new foundry later in the year.

The Board of City Commissioners, Chattanooga, Tenn., is planning for the erection of a one-story municipal automobile service and repair works to cost about $90,000 with equipment.

S. G. Bralley, Smalley, Ky., has plans underway for the organization of a company to operate an electric light and power plant and is interested in prices on all kinds of equipment.

The Knoxville Power & Light Co., Knoxville, Tenn., is disposing of a preferred stock issue of $490,000, a portion of the proceeds to be used for extensions.

The Ashland Clay & Metal Products Co., Ashland, Ky., recently organized, has plans for a one-story foundry and machine shop, with general mechanical works at Bellefonte Crossing. The buildings will be each one-story, 45 x 300 ft., and 65 x 135 ft., respectively. The foundry will be used primarily for the production of gray iron castings. Leo Meehan is one of the heads of the company in charge.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, will soon begin the erection of a one-story foundry at its branch works at Louisville, 140 x 175 ft., estimated to cost $100,000 with machinery.

The engineering division, air service, McCook Field, Dayton, Ohio, will take bids until June 10, for 50 pump drive assemblies, circular 108.

Indiana

INDIANAPOLIS, May 26.

PLANS are being considered by the Howard Shipbuilding Co., Jeffersonville, Ind., for a new one-story machine shop, 50 x 300 ft., estimated to cost $50,000 including equipment.

The G. I. Sellers & Son Co., North Thirteenth Street, Elwood, Ind., manufacturer of kitchen cabinets and other wood products, has preliminary plans for a two-story addition, estimated to cost $50,000, including equipment.

The Chamber of Commerce, Monon, Ind., has had plans drawn for a one-story factory, 60 x 360 ft., to be occupied under lease by a company to manufacture mechanical equipment, with name to be announced later. It will cost about $35,000. Leichenke & Esser, 38 South Dearborn Street, Chicago, are architects.

Electric motors, controls, conveying machinery and other equipment will be installed in the one-story printing plant, 120 x 250 ft., to be erected on East Washington Street, Indianapolis, by the Cornelius Printing Co., Indianapolis, estimated to cost $175,000, of which approximately $100,000 will be used for machinery. George M. Cornelius is president and treasurer.

Cleveland

CLEVELAND, May 26.

THE market continues to drag with the volume of sales light and few new inquiries. No new inquiries for lots of any size are reported and some of the business which has been pending for some time seems no nearer the closing point. The General Electric Co. during the week placed two large turret lathes with a local manufacturer for its Schenectady plant. Makers of automatic screw machines report a little improvement in inquiry, but mostly for single machines. In the automobile field, the Hup Motor Car Corporation has been buying a few tools and is figuring on four additional machines for its tool room. Demand for used machinery continues more active than for new tools.

The Humphrey Mfg. Co., Mansfield, Ohio, has completed plans for a one-story factory, 80 x 220 ft., at an estimated cost of $40,000.

The city of Canton will take bids this week for a $600,000 addition to its sewage disposal plant. Pumps, gravel washing machinery and other equipment will be required. McKlaskey & Reese, 500 Renkert Building, Canton, are the engineers.

The American Malleable Casting Association, Marion, Ohio, is planning the erection of a core department and other extensions.

The Ideal Laundry Co., 1936 Canton Avenue, Toledo, Ohio, is preparing plans for a $50,000 power house. S. M. Jokel, Nicholas Building, Toledo, is the architect.

The City Council, Toledo, Ohio, is arranging for a bond issue of $142,000, a portion of the proceeds to be used for the purchase of electrical sewage plant pumping machinery and other equipment. Walter Stewart is director of finance.

Manual training and vocational departments will be installed in the new school now under construction at Mogadore, Ohio, to cost $90,000. The Board of Education is in charge.

The Lorain Heater Co., Lorain, Ohio, is disposing of a $250,000 stock issue, the proceeds to be utilized in carrying out a program of expansion, to include the construction of an addition and the installation of equipment.

The Cleveland & Pittsburgh Railroad has tentative plans under way for a new roundhouse and locomotive repair shop at New Philadelphia, Ohio, replacing the present building. Considerable equipment will be purchased. J. L. Taylor is engineer of maintenance of way.

The Highway Constructin Co., Elyria, Ohio, has acquired five acres at East 144th Street and the Erie Railroad, Cleveland, upon which it is planned to erect a complete asphalt manufacturing plant, to cost $100,000 including equipment.

South Atlantic States

BALTIMORE, May 26.

THE Southern Railway, whose purchasing office is in Washington, D. C., has issued an inquiry for 18 machine tools for its shops at Birmingham, quotations to include freight rate to Birmingham. The list follows:

Two 16-in. portable bolt lathes, to take 30 in. between centers.
One 24-in. heavy-duty lathe, 9 ft. between centers.
Three 16-in. belt-driven Fox lathes.
One No. 4 universal milling machine.
One 48-in. vertical milling machine.
One keyway miller, ¼ in. to 1 in.
One 12-in. slotter.
One 6-in. two-spindle centering machine.
One 16-in. die sinking machine, belt drive.
One 20-in. tool room drill press, belt drive.
One power hack saw for tool room.
One nut-facing machine.
One heavy boring machine for boring locomotive side rods, capacity holes, 6 in. to 14 in. diameter.
One internal grinder, equivalent to Heald No. 60.
One 2500-lb. single-frame steam hammer.

A. K. Robins & Co., Market Place, Baltimore, manufacturers of canning machinery, have acquired a building at Lombard and Concord Streets, totaling about 30,000 sq. ft., and will remodel for a new plant. R. A. Sindall is president and treasurer. Plans are said to be under advisement for removing the present works to the new location.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for three boilers, each 350 hp. rating, to operate under 250 lb. pressure; a 200 hp. motor, three-phase, 60-cycle, 2200 volts; three transformers, 50 kva. each; one steel tank, capacity 200,000 gal. or larger, and one standard cast iron type acid egg, 300 gal. capacity.

The Carolina Power & Light Co., Raleigh, N. C., has disposed of an additional bond issue of $1,300,000, a portion of the proceeds to be used for extensions and betterments in plants and system.

The City Council, Durham, N. C., will receive bids until June 26 for a combined pumping and power station, with one 10-ton traveling crane; valves, pipe and fittings; 22,000-volt transmission line, and auxiliary work, as per plans and specifications on file. William M. Piatt, Durham, is engineer.

The McKaig Machinery Exchange, Cumberland, Md., is in the market for a second-hand, one-man electric welder, with either motor or gas engine drive, either stationary or portable.

The Hearn Oil Co., Wilmington, Del., has acquired property on the Christiana River, South Wilmington, and has plans under way for an oil storage and distributing plant, estimated to cost $100,000 with machinery. Claude P. Hearn is president.

The Wortendyke Mfg. Co., Richmond, Va., manufacturer of paper products, has awarded a general contract to the Harrison Construction Co., Richmond, for its four-story mill at Byrd and Thirteenth Streets, estimated to cost $200,000 with machinery. Carneal & Johnson, Richmond, are architects.

The North Carolina Granite Corporation, Mt. Airy, N. C., is planning to purchase a 20-ton locomotive crane, standard gage, with 35 to 40 ft. boom.

The Chimney Rock Mountains, Inc., Chimney Rock, N. C., has engaged Mees & Mees, Charlotte, N. C., engineers, to prepare plans for a hydroelectric power plant, with power dam, at its proposed development at Lake Lure. The entire project will cost close to $3,000,000. Dr. L. B. Morse is president.

The Town Council, Walnut Cove, N. C., will take bids until June 3 for two 400 hp. vertical water-wheels, direct-connected to two umbrella type generators of like capacity, with governors and auxiliary equipment. I. W. Barber, Mt. Airy, N. C., is engineer. H. R. McPherson is town clerk.

The Board of Aldermen, Winston-Salem, N. C., plans the installation of electric-operated pumping machinery in connection with extensions and improvements in the municipal waterworks estimated to cost $750,000. Bonds have been approved.

The Standard Oil Co., St. Paul Place and Franklin Street, Baltimore, has plans for enlargements in its oil storage and distributing works, including five one-story buildings, 30 x 50 ft., each, estimated to cost $100,000 with equipment.

The Edwards Railway Motor Car Co., Sanford, N. C., recently organified to manufacture and assemble motor buses, etc., has awarded a general contract to the Truscon Steel Co., Youngstown, Ohio, for its initial plant unit, 80 x 150 ft. H. P. Edwards is president.

T. E. King, Springfield, Ga., machinery dealer, is in the market for a back-geared shaper, with vise attached, 18 to 20 in.; one back-geared, power feed drill press; one 15 to 20 kva. generator, direct-connected to steam engine, complete with exciter, switchboard, etc.

Gulf States

BIRMINGHAM, May 26.

PLANS are being considered by the Board of City Commissioners, Anna Maria, Fla., for the installation of a municipal electric power house and ice-manufacturing plant.

The Ford Motor Co., Detroit, has awarded a general contract to the Kansas City Structural Steel Co., Kansas City, Mo., for its assembling plant on East Grand Avenue, Dallas, Tex., 301 x 840 ft., estimated to cost $800,000 with machinery.

The Tips Engine Works, Austin, Tex., is in the market for 3-hp. engine air compressor sets, direct-connected for pumping air up to 150 lb.

The Gulf Refining Co., Diamond Hill, Fort Worth, Tex., is perfecting plans for additions in its gasoline and other oil refineries in this section, estimated to cost $750,000 with machinery.

The Common Council, Claude, Tex., is planning for a bond issue of $35,000, the entire proceeds to be used for the installation of a municipal electric light and power plant. It is also arranging a fund of $45,000 for the construction of a municipal waterworks, with pumping station, etc.

The Perry Foundry & Machine Co., Perry, Fla., has begun the erection of a new plant estimated to cost $30,000. The present works will be removed to the new location and additional equipment installed. H. T. Wilkes heads the company.

The Town Council, Coushatta, La., will take bids until June 11 for equipment for a waterworks and sewage system, including one 200-gal. per minute motor-driven or gas-engine driven centrifugal pump, and auxiliary equipment; steel tank and tower, 75,000 gal. capacity; valves and boxes, pipe, etc., plans and specifications on file at the office of E. T. Archer & Co., New England Building, Kansas City, Mo., engineers.

The Mengel Co., Louisville, manufacturer of wood boxes, etc., is completing arrangements for its new plant near Baton Rouge, La., for the manufacture of automobile wheels, estimated to cost $1,000,000 with machinery.

Fire, May 21, destroyed a portion of the plant of the Humble Oil & Refining Co., at Webster, Tex., with loss estimated at $500,000 including tanks and other equipment. It is planned to rebuild. Headquarters of the company are at Houston.

The Common Council, Ralls, Tex., is considering the installation of electric-operated pumping equipment in connection with proposed extensions in the municipal waterworks estimated to cost $50,000.

The Demountable Battery Corporation, Alexandria, La., recently organized, has acquired a building at Front and De Soto Streets, for the manufacture of electric storage batteries, plates, etc. W. Knoblock heads the company.

The Cherokee Rock Asphalt Co., Cherokee, Ala., has plans for new works on a local deposit of sandstone rock asphalt, recently acquired, with machine shops and power plant, estimated to cost $400,000 including machinery. Dr. Miller Reese Hutchison, 233 Broadway, New York, is understood to be interested in the project.

The Texas Power & Light Co., Dallas, Tex., has acquired lignite property at Malakoff, Tex., and is reported to be planning for the construction of a steam-operated electric power plant in this section. J. F. Strickland is president.

The City Commission, Tampa, Fla., will receive bids until June 24 for equipment for extensions and improvements in the waterworks, including two horizontal watertube boilers, complete with fuel oil storage and burning equipment; two low and two high-lift steam-operated turbo-centrifugal pumps, and two motor-driven fire pumps; two 500,000 gal. capacity and one 100,000 gal. capacity steel tanks on towers; radial brick chimney; gate valves, pipe, and auxiliary equipment. W. Lesley Brown is city manager, in charge.

O. R. Seagraves and associates, Galveston, Tex., have plans underway for a 20-mile pipe line between the White Point gas fields and Robstown, Tex., for which some pumping and other equipment will be purchased.

Pacific Coast

SAN FRANCISCO, May 21.

CONTRACT has been awarded by the American Can Co., 120 Broadway, New York, to Lindgren & Swinerton, Standard Oil Building, San Francisco, for a three-story machine shop on the block bounded by Seventeenth, Mariposa, Alabama and Florida Streets, estimated to cost $300,000 with machinery.

The Portland Electric Power Co., Portland, Ore., recently organized to take over and succeed the Portland Railway, Light & Power Co., has issued bonds for $3,500,000, a portion of the proceeds to be used for extensions and improvements.

The Petroleum Export Corporation, Pacific Electric Building, Los Angeles, has plans for a new oil storage and distributing works on Terminal Island, San Pedro Harbor, consisting of six six-story buildings, each 100 x 300 ft., with smaller structures, estimated to cost $3,000,000 including machinery.

The California-Oregon Power Co., Portland, Ore., will issue bonds for $4,000,000 and capital stock for $1,000,000, the proceeds to be used for the erection of a second hydro-electric generating plant on the Klamath River, Washington. The entire output will be used by the Pacific Gas & Electric Co., San Francisco.

The Strauss Mfg. Co., East Fiftieth and Sherman Streets, Portland, Ore., manufacturer of furniture, is planning to rebuild the portion of its plant destroyed by fire May 15, with loss estimated at $100,000 including machinery.

The Berkeley Steel Construction Co., Berkeley, Cal., has work in progress on a new plant at Second and Camillia Streets, comprising foundry and machine shop, for the manufacture of steel tanks and other riveted plate products. T. S. Neilson is president.

The Pacific Foundry Co., 1113 St. Paul Street, Tacoma, Wash., is planning for the erection of a one-story addition estimated to cost $25,000. John Borger is president.

The Mountain States Power Co., Sandpoint, Idaho, will begin the construction of an addition to its steam-operated electric generating plant at Big Ford, Mont., estimated to cost $100,000 including machinery. A 175 kw. generator and auxiliary machinery will be installed.

The Ord Ice Co., Oxnard, Cal., will soon break ground for an addition to its ice-manufacturing plant to cost $100,000. The installation will include a 150-ton refrigerating machine, 75-ton ice-making machine, 200 hp. gas engine and auxiliary equipment. John Miller is manager.

Canada

TORONTO, May 26.

INQUIRY for machine tools the past several days has been increasing and the general tone of business is taking a turn for the better. While sales were chiefly confined to small lots, the total volume was slightly better than for any corresponding period this month. Inquiries during the week included several for works now under construction and considerable buying is also expected shortly for waterworks and sewage plants.

Instruments, Ltd., Richmond Street, Toronto, is in the market for a second-hand screw cutting lathe, 11-in. compound slide rest, back gear; also small motor and bench drill to take from ⅜ to ½-in.

The National Castings, Ltd., Belleville, Ont., is in the market for sand blast equipment for an addition under construction.

The Canada Wood Specialty Co., Orillia, Ont., is asking for equipment for the manufacture of woodenware, etc.

The Town Council, St. Thomas, Ont., is having plans prepared for a sewage disposal plant to cost $80,000.

The Town Council, Belleville, Ont., has awarded con-

tracts in connection with $300,000 addition to the waterworks plant. Gore, Nasmith & Storrie are engineers.

The St. Maurice Paper Co., Cap de la Madeleine, Que., has started work on the erection of a machine room to cost $500,000. Louis Duchaineau is general foreman.

The Superior Electric Co., Ltd., Pembroke, Ont., whose plant was recently damaged by fire, is receiving bids for rebuilding. New equipment will be purchased.

The Dominion Forge & Stamping Co., Ford, Ont., has awarded contract to Wells & Gray, for addition to its plant.

The Canadian Steel Foundries, Ltd., Longue Point, Que., has let a general contract to John MacGregor, Ltd., for an addition to the foundry.

Prest-O-Lite of Canada, Ltd., Toronto, has awarded a general contract to Wells & Gray, Ltd., Confederation Life Building, Toronto, for addition to its plant.

Western Canada

The city engineer, A. W. Harrow, Edmonton, Alta., is preparing plans for the first unit of a $60,000 sewage disposal plant, for which bids will soon be called.

Spratt & Co., Port Alberni, B. C., are in the market for complete equipment for a sawmill. C. J. Spratt is purchasing agent.

The Dowling Furniture Co., 226 Second Avenue, Vancouver, B. C., is erecting a factory and is in the market for woodworking machinery and tools. T. E. Dowling is purchasing agent.

STEEL AND INDUSTRIAL STOCKS

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	41⅝	43¼	Int. Har. pf.....	109	109
Allis-Chal. pf...	92	93	Lima Loco.....	56½	57½
Am. B.S. & Fdy.	80	82¼	Nat.-Acme	6½	7⅛
Am. Can.....	98½	104⅜	Nat. En. & Stm.	18⅜	22½
Am. Can pf.....	112¾	113⅜	N. Y. Air Brake.	36⅜	39¾
Am. C. & F. pf.	121¾	121⅜	Nova Scotia Stl.	10½	11
Am. Locomotive.	70½	73	Otis Steel.....	7⅞	7⅝
Am. Radiator....	97	98⅝	Otis Steel pf....	53	53½
Am. Steel Fdries	33⅞	34½	Pressed Steel Car	47⅛	48½
Bald. Locomotive.	104⅜	110¼	Replogle Steel...	8	8⅛
Bald. Loco. pf...	115	115	Republic	43⅛	45⅝
Beth. Steel.....	46¼	49½	Republic pf.....	85	88
Beth. Stl. 7% pf.	92⅝	93	Sloss-Sheffield ..	52	56
Beth. Stl. 8% pf.	106	106	Sloss-Sheffield pf.	82	82
Br. Em. Stl. 2 pf.	10½	10¾	Steel of Canada.	71	72½
Chic. Pneu. Tool.	81⅞	85⅞	Transue-Wms....	25½	25½
Colo. Fuel.....	38	41⅜	Un. Alloy Steel..	25	25⅛
Crucible Steel...	48⅝	52½	U. S. Pipe	79	87
Crucible Stl. pf.	86	90	U. S. Pipe pf.....	90	90
Deere pf	61	62	U. S. Steel	95	98
Gen. Electric....	212	221	U. S. Steel pf	119	119¾
Gt. No. Ore Cert.	26	27	Vanadium Steel..	21½	22¾
Gulf States Steel	62	67	Va. I., C. & Coke	36	41
Inland Steel.....	31½	32	W'house Air Br.	87	87
Int. Har.	83¾	86	Youngs'n S. & T.	63	63

Republic Iron & Steel Co. Sees Good Year

Earnings of the Republic Iron & Steel Co. in the current year to date were nearly sufficient to cover preferred dividend requirements for the entire year, Chairman John A. Topping announced after the directors' meeting on May 21, when the regular quarterly disbursement was declared. Mr. Topping said that while current operations are down to a 50 per cent basis, it is unlikely that they will go much lower, since stocks are close to the exhaustion point. For this reason some improvement in the volume of business is expected.

"While present conditions," he added, "are in no sense comparable with those prevalent in 1921, yet during that year the country consumed close to 50 per cent of its ingot capacity, and it seems reasonable to assume that under conditions now prevalent, which are decidedly more favorable, this year's requirements should be considerably larger."

The Otis Steel Co. reports net profits for the first quarter of $174,072 after charges and taxes, but before depreciation. This compares with $248,959 in the first quarter of 1923. During the first quarter of 1924 the company purchased $216,000 first mortgage bonds for the sinking fund, reducing the bonded debt to $9,434,000. Current assets on March 31 were reported at $9,213,642 against current liabilities of $4,306,739.

The Pullman Co. reports net income for 1923 of $50,356,119 after taxes and deductions, as compared with net income of $12,636,174 in the preceding year.

The Allis-Chalmers Mfg. Co. reports net profit for 1923 of $2,703,636, against $2,208,549 in 1922, in each case all expenses and reserves for taxes having been deducted. Surplus at the close of 1923 stood at $517,595, as compared with $22,908 at the close of 1922.

The Timken Detroit Axle Co. reports net income for 1923 of $600,881, after charges and taxes, compared with $175,000 in 1922. Profit and loss surplus at the end of 1923 was $4,517,769, as compared with $4,122,545 in the previous year. Current assets on Dec. 31 were $7,255,597, including $434,893 cash, while current liabilities totaled $2,384,434.

The General Refractories Co. reports income for the year ended Dec. 31, of $815,872, after depreciation, depletion and interests. Net sales aggregated $9,785,376. Surplus for the year was $187,522.

The Penn Seaboard Steel Corporation reports a deficit of $17,506 after interest and idle plant expenses, etc., for the first quarter. This compares with a surplus of $44,443 in the corresponding period of 1923.

Net income of the Duluth & Iron Range Co. for 1923 amounted to $1,584,962 after taxes, charges, etc., equivalent to $24.38 per share earned on the outstanding $6,500,000 capital stock. This compares with net income of $1,505,182 in the preceding year.

The J. F. Davis & Sons Co., De Pere, Wis., manufacturer of boilers, structural work and fabricated steel wheels for motor trucks, tractors and motor buses, has been placed in the hands of a receiver on petition of creditors. Schedules have been filed which admit liabilities of $333,035, and claim assets of $309,997. Unsecured claims aggregate $326,941.

Report of the Wickwire Spencer Steel Corporation for the year ended Dec. 31, 1923, showed net income of $351,353, after interest, depreciation and other charges, compared with net loss in 1922 of $840,264. President T. H. Wickwire told stockholders that an adjustment of the company's financial structure is necessary to provide adequate working capital. This appears clearly in the balance sheet, which shows working capital of only $4,119,984, and gross business last year of $27,500,000.

Directors of the Youngstown Sheet & Tube Co. on May 20 declared the regular quarterly dividends of $1.25 per share on common stock and $1.75 on preferred, both payable July 1 to stock of record June 20.

A petition asking the court for a permit to sell the Bates Machinery & Tractor Co., Joliet, Ill., against which bankruptcy proceedings are pending, probably will be filed within the next few weeks. Chicago and other creditors are willing that the property be sold so that a reorganization may be effected.

Directors of the Virginia Iron, Coal & Coke Co. passed the dividend on common stock due at this time. The regular semi-annual dividend of 2½ per cent, however, was declared on preferred stock, payable July 1 to stock of record June 17.

In its balance sheet as of April 30 the Crucible Steel Co. of America showed earnings sufficient to cover dividends and to provide an addition to surplus. Unfilled orders on Feb. 28, 1923, were 77,106 tons and at present they exceed 70,000 tons. Current assets as of April 30, 1924, were $28,560,874, and current liabilities, $1,536,432. Working capital of $27,024,442 compared with $26,634,391 a year ago. Chairman H. S. Wilkinson said, "The recession in the steel business has not affected the demand for our tool and high grade steels to the same extent as has been reported with respect to the tonnage steels."

Properties owned by the Lackawanna Steel Co., taken over several months ago by the Bethlehem Steel Co. were placed under the consolidated mortgage of the Bethlehem Steel Corporation of New Jersey on which $87,500,000 in bonds have been authorized of a total authorization of $500,000,000 under a mortgage executed in August, 1918, but not heretofore filed in New York State. The mortgage tax was $91,446, the largest ever paid on a single mortgage in Erie county, New York. The property that is given to the Guaranty Trust Co. of New York as additional security for the issue of Consolidated Bethlehem mortgage bonds, includes practically all of the real holdings of which the Bethlehem company acquired possession when it bought the Lackawanna steel plant.

President Samuel M. Vauclain of the Baldwin Locomotive Works stated on May 29 that production operations of the plant at Philadelphia will be increased from 35 to 40 or 45 per cent on June 1, and that by July 1 he expects to run at 50 per cent of capacity. Orders now on hand aggregate over $11,000,000 and new orders are coming in steadily. A rolling stock order brought by Mr. Vauclain from Mexico totals 16,000,000 pesos.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.49c.
Swedish charcoal iron bars, base	7.00c.
Soft steel bars, base price	3.49c.
Hoops, base price	4.59c.
Bands, base price	4.09c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.59c.
Channels, angles and tees under 3 in. x ¼ in., base	3.49c.
Steel plates, ¼ in. and heavier	3.59c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.55c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	4.05c.
Toe-calk, ½ x ⅜ in. and larger	4.50c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth, spring steel	4.50c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c.
Squares, flats and hex	4.90c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.14c.
No. 12	4.19c.
No. 14	4.24c.
No. 16	4.34c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.55c. to 4.70c.	.....
Nos. 22 and 24	4.70c. to 4.85c.	5.10c.
No. 26	4.75c. to 4.90c.	5.15c.
No. 28*	4.85c. to 5.00c.	5.25c.
No. 30	5.05c. to 5.20c.	.....

Galvanized

	Per Lb.
No. 14	4.95c. to 5.10c.
No. 16	5.10c. to 5.25c.
Nos. 18 and 20	5.25c. to 5.40c.
Nos. 22 and 24	5.40c. to 5.55c.
No. 26	5.55c. to 5.70c.
No. 28*	5.85c. to 6.00c.
No. 30	6.35c. to 6.50c.

*No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel			*Wrought Iron*		
	Black	Galv.		Black	Galv.
⅛ in. Butt	—41	—24	⅛ in. Butt	— 4	+19
¼ in. Butt	—46	—32	¼ in. Butt	—11	+ 9
1-3 in. Butt	—48	—34	1-1½ in. Butt	—14	+ 6
2½-6 in. Lap	—44	—30	2 in. Lap	— 5	+14
7-8 in. Lap	—41	—11	2½-6 in. Lap	— 9	+ 9
9-12 in. Lap	—34	— 6	7-12 in. Lap	— 3	+16

Bolts and Screws

Machine bolts, cut thread,
45 and 10 to 45, 10 and 10 per cent off list
Carriage bolts, cut thread,
35 and 10 to 35, 10 and 10 per cent off list
Coach screws, 45 and 10 to 45, 10 and 10 per cent off list
Wood screws, flat head iron,
75, 20 and 10 per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16¾c. to 17¾c.
High brass wire	17¼c. to 18¼c.
Brass rods	14½c. to 15½c.
Brass tube, brazed	24¾c. to 25¾c.
Brass tube, seamless	21 c. to 22 c.
Copper tube, seamless	22¼c. to 23¼c.

Copper Sheets

Sheet copper, hot rolled, 20¼c. to 20¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20	
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Prime / Seconds
		80 lb.	$6.55 / $6.30
		90 lb.	6.65 / 6.40
		100 lb.	6.75 / 6.50
IC	$11.75 / $9.50	IC	7.00 / 6.75
IX	13.25 / 11.50	IX	8.25 / 8.00
IXX	14.50 / 12.50	IXX	9.50 / 9.25
IXXX	15.50 / 13.75	IXXX	10.75 / 10.50
IXXXX	16.50 / 14.75	IXXXX	12.00 / 10.75

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	46c.
Bar	48c. to 53c.

Copper

Lake ingot	16 c.
Electrolytic	15½c.
Casting	14½c.

Spelter and Sheet Zinc

Western spelter	7½c.
Sheet zinc, No. 9 base, casks	10½c. open 11¼c.

Lead and Solder*

American pig lead	8½c. to 9c.
Bar lead	11c. to 12c.
Solder, ½ and ½ guaranteed	34¾c.
No. 1 solder	32¾c.
Refined solder	28¾c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	11½c. to 12c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.

Old Metals

The market continues uncertain. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	10.75
Copper, heavy wire	10.25
Copper, light bottoms	8.75
Brass, heavy	6.25
Brass, light	5.00
Heavy machine composition	8.00
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	7.50
Lead, heavy	5.75
Lead, tea	4.25
Zinc	3.50
Cast aluminum	14.50
Sheet aluminum	14.50